

# Chapter 1

[Law](#), [Crime](#)



Chapter 1 THE PROBLEM AND ITS COPE Introduction Since the Stone Age, the human race seeks for strategies to extend its viewing range. With the rise of technology in the twentieth century, cameras are found to be a very useful tool to survey a large area with limited resources. With an increasing numbers of cameras, it becomes more difficult to watch every monitor and prevent incidents in the surveillance area. For the last decades, research seeks for possibilities to automate the process of video surveillance. Video surveillance has long been in use to monitor security sensitive areas such as banks, department stores, highways, crowded public places and borders. The advance in computing power, availability of large-capacity storage devices and high speed network infrastructure paved the way for cheaper, multi sensor video surveillance systems. Traditionally, the video outputs are processed online by human operators and are usually saved to tapes for later use only after a forensic event. The increase in the number of cameras in ordinary surveillance systems overloaded both the human operators and the storage devices with high volumes of data and made it infeasible to ensure proper monitoring of sensitive areas for long times. In order to filter out redundant information generated by an array of cameras, and increase the response time to forensic events, assisting the human operators with identification of important events in video by the use of video surveillance systems has become a critical requirement. The making of video surveillance systems requires fast, reliable and robust algorithms for moving object detection, classification, tracking and activity analysis. In recent years, with the latest technological advancements, off-the-shelf cameras became vastly available, producing a huge amount of content that can be used in various

application areas. Among them, visual surveillance receives a great deal of interest nowadays. Until recently, video surveillance was mainly a concern only for military or large-scale companies. However, increasing crime rate, especially in metropolitan cities, necessitates taking better precautions in security-sensitive areas, like country borders, airports or government offices. Even individuals are seeking for personalized security systems to monitor their houses or other valuable assets. Old-fashioned security systems were vastly relying on human labor instead of system hardware. As a result, detection and assessment of threat was limited with the concentration of the human operator. Additionally, area under surveillance may be too large to be monitored by a few operators and number of cameras may exceed their monitoring capability. This situation forces the use of more personnel, which makes it even a more expensive task in an era of technological equipment's' being much cheaper than the human resource. The sole answer for this increasing demand for personal and societal security is automation. The vast amount of data acquired from video imagery should be analyzed by an intelligent and useful autonomous structure. This intelligent system should have the capacity to observe the surrounding environment and extract useful information for subsequent reasoning, like detecting and analyzing the activity (motion), or identifying the objects entering the scene. Besides, monitoring should be done 24- hours-a-day, without any interruption. This sort of a system will achieve the surveillance task more accurately and effectively, saving a great amount of human effort. In current years, as network bandwidth and computer processing capability and storage capacity to rapidly increase, and various video monitoring information processing

technology appearing, video monitoring technology having entered the whole world digitization. With microelectronics, communications and computer technology is developing rapidly, monitoring the traditional approaches have failed to meet the growing market demand due to its waste of network resources, a greater delay and easy to lead network congestion disadvantages. Monitoring is the regular observation and recording of activities taking place in a project or programmed. It is a process of routinely gathering information on all aspects of the project, supervising activities in progress to ensure they are on-course and on-schedule in meeting the objectives and performance targets. To monitor is to check on how project activities are progressing. It is observation; a systematic and purposeful observation. Monitoring also involves giving feedback about the progress of the project to the donors, implementers and beneficiaries of the project. Reporting enables the gathered information to be used in making decisions for improving project performance. To observe, supervise, or keep under review; to measure or test at intervals, especially for the purpose of regulation or control, or to check or regulate the technical quality of something. On the other hand, surveillance is a process of close monitoring of behavior. Ongoing close observation and collection of data or evidence, for a specified purpose or confined to a narrow sector. In comparison, environmental scanning is broad and includes all associated external factors. "Sur-Veillance" is French for to "watch from above". Note the all seeing "eye-in-the-sky" in this London Transport poster. Although the word surveillance literally means (in French) "to watch from above" (i. e. a God's-eye view looking down from on-high) the term is often used for all forms of

observation, not just visual observation. However, the all-seeing eye-in-the-sky is still an icon of surveillance in general. It is commonly used to describe observation from a distance by means of electronic equipment or other technological means. Surveillance is the art of watching over the activities of persons or groups from a position of higher authority. Surveillance may be covert (without their knowledge) or overt (perhaps with frequent reminders such as "we are watching over you"). Surveillance has been an intrinsic part of human history. Sun Tzu's *The Art of War*, written 2,500 years ago, discusses how spies should be used against a person's enemies. But modern electronic and computer technology have given surveillance a whole new means of operation. Surveillance can be automated using computers, and people leave extensive records that describe their activities. Counter surveillance is the practice of avoiding surveillance or making it difficult. Before computer networks, counter surveillance involved avoiding agents and communicating secretly. With recent development of the Internet and computer databases counter surveillance has grown. Now counter surveillance involves everything from knowing how to delete a file on a computer to avoiding becoming the target of direct advertising agencies. Inverse surveillance is the practice of reversalism on surveillance, e. g. citizens photographing police, shoppers photographing shopkeepers, and passengers photographing cab drivers who usually have surveillance cameras in their cabs. A well-known example is George Haliday's recording of the Rodney King beating. Inverse surveillance attempts to subvert the panoptic gaze of surveillance, and often attempts to subvert the secrecy of surveillance through making the inverse surveillance recordings widely

available (in contrast to the usually secret surveillance tapes). Surveillance Camera are video cameras used for the purposed of observing an area. They are often connected to a recording device, IP network, and/or watched by a security personnel/law enforcement officer. Video Surveillance Systems consist of cameras placed in areas where they can monitor activity as it takes place. These cameras may include features like pan, tilt, and zoom; may be placed in outdoor or indoor locations; and may include infrared recording options. Most cameras are used with recording systems, either VCR's or digital recorders. Using a digital recorder is the preferred option for easy storage, easy recall, and easy viewing over different monitors. The first Video Surveillance System was installed by Siemens AG at Test Stand VII in Peenemunde, Germany in 1942, for observing the launch of V-2 rockets. The noted German engineer Walter Bruch was responsible for the design and installation of the system. Outside government special facilities, Video Surveillance was developed initially as a means of increasing security in banks. Experiments in the UK during the 1970s and 1980s led to several larger trial programs later that decade. These were deemed successful in the government report and paved the way for a massive increase in the number of Video Surveillance systems installed. Today, systems cover most town and city centers, and many stations, car-parks and estates. Video Surveillance recording systems are still often used at modern launch sites to record the flight of the rockets, in order to find the possible causes of malfunctions. Video Surveillance System is one of the most effective devices that can be used for monitoring the behavior activities or other changing information, usually of the people and often in surreptitious manner. In our school, it is

important to increased safety and security for the students as well its' personnel. The schools are the place where students should feel safe from harm, outside stimulus, and other threats. Sadly to say, in the past few years, there are some instances where schools are not the safe haven we thought they were, take for instance what happened at Philippine Maritime Institute (PMI), where one of the professors was gun shot at the head inside the campus by one of the students. If only the management of the school strengthen its security system, none of this would happen. Base on the above mentioned situation, the researcher come up with an idea that could improve the security system not only for schools and universities but for all the entities and establishment in the Philippines. That is: The incorporation of a surveillance camera to its security system. One of the features of this research is that, an embedded system is incorporated by integrating a thermal scanner and an X-ray in the security system (for future expansion). One of the most popular Surveillance tools for Schools is the Secure View System. The system transmits images from cameras to a digital hard drive storage system. Output can be seen on a monitor that displays four frames of video or on desktop computer monitors, which are networked to receive video feeds from the cameras.

**Theoretical/Conceptual Framework** This study is based on the theory of "Multi-camera video surveillance system", by Maarten Somhorst (January 14, 2012), Master of Science thesis Man-machine interaction group Delft University of Technology, according to him, a surveillance system model is designed that detects suspicious behavior in a non-public area. Its task is to alert the operators about suspicious events to give them the chance to investigate and take action. Two prototype

applications are implemented and experiments are conducted to show the performance. We showed the proof-of-concept of a system which is able to emulate operators and can potentially outperform a human being. Once the system knows what is considered suspicious behavior it can be automatically detected. This document is the result of his graduate project that finalizes the master program Media and Knowledge Engineering. The project is entitled " Multi-camera video surveillance system" and is performed on the University of Technology Delft, The Netherlands. The enthusiasm of Prof. L. Rothkrantz about video surveillance quickly infected me. Especially the reasoning and multi-agent aspects of the idea sounded interesting to me. Another theory, which supports this study, is the thesis document presented by Yiğithan Dedeoğlu M. S., in Computer Engineering, Supervisor: Assist. Prof. Dr. Uğur Gökükbay (August, 2004), in which a video surveillance system with real-time moving object detection, classification and tracking capabilities is presented. The system operates on both color and gray scale video imagery from a stationary camera. It can handle object detection in indoor and outdoor environments and under changing illumination conditions. The classification algorithm makes use of the shape of the detected objects and temporal tracking results to successfully categorize objects into pre-defined classes like human, human group and vehicle. The system is also able to detect the natural phenomenon fire in various scenes reliably. The proposed tracking algorithm successfully tracks video objects even in full occlusion cases. In addition to these, some important needs of a robust smart video surveillance system such as removing shadows, detecting sudden illumination changes and distinguishing left/right



objects are met. On other related projects and research is about the CCTV. Closed-circuit television (CCTV) is the use of video camera to transmit a signal to a specific place, on a limited set of monitors. CCTV was first utilized by the United States Military in the 1940s. Closed circuit cameras were set up during the testing of the V2 missile in order to safely monitor the tests. By using CCTV, officials were able to monitor the testing at close range without danger, watching out for defects and other problems that might have otherwise gone undetected. In the 1960s, officials in the UK began installing CCTV systems in public places to monitor crowds during rallies and appearances of public figures. Installation of cameras became more popular, both in public spaces and retail stores, as the technology developed. Today in Britain, CCTV cameras monitor roads, sidewalks and squares in city centers, public rail stations and buses, as well as in retail shops and other businesses. In 1996, government spending on CCTV technology accounted for three quarters of the crime prevention budget in the UK. In the United States, the first CCTV system set up in a public building was in 1969 in the New York City Municipal building. This practice quickly spread to other cities and was soon widely implemented. Unlike the UK, CCTV in public spaces in the United States is rarely used. However, in the 1970s and 80s, CCTV use became more common in establishments prone to security threats, like banks, convenience stores, and gas stations. Security cameras were installed in the World Trade Center as a preventative after the terrorist attack in 1993. By the mid-90s, ATMs across the country were commonly equipped with CCTV cameras, and many retail stores used CCTV to prevent theft. Personal use of CCTV technology has become more widespread as the technology has

become much easier to acquire. Many utilize CCTV systems in their own homes to catch cheating spouses, or to monitor the care of their children in "Nannycams." Figure 1 in the next page is the schema of the study. It illustrates the concept of the study that describes the entire process of the system. The first box demonstrates the possible Specific Input of the system which is the Survey Questionnaire, Video Surveillance Equipment and Captured Videos and Images. The second box demonstrates the possible specific Process of the system which is the, installation of Video Surveillance Equipment, Observation through surveillance equipment, Distribution and retrieval of the survey questionnaire, and Analysis and computation of data gathered. The third box demonstrates the possible specific Output of the system which is the, Detect movement, produce sound alarm when movements detected, send sms or mms /alert to the client, and receiving of notification alert via internet to the client.

OUTPUT PROCESS INPUT \* Survey Questionnaire \* Video Surveillance equipment \* Captured videos and images

Planning Requirements Gatherings/Analysis Design Coding Testing Specific Process: \* Installation of Video Surveillance Equipment \* Observation through surveillance equipment \* Distribution and retrieval of the survey questionnaire \* Analysis and computation of data gathered

Video Surveillance with SMS and MMS Support System Specific Output: \* Detect movements \* Produce sound alarm when movements detected \* Send SMS or MMS /alert to the client \* Receiving of notification alert via internet to the client

Figure 1 Schema of the Study The input of the study consisted of the typical Video Surveillance Equipment like Video Cameras, Monitor and a trap. This study also consists of a Survey Questionnaires. The process composed

of Installation of Video Surveillance Equipment, an observation through the Video Surveillance Equipment, the distribution and retrieval of Survey Questionnaires then the analysis and computation of all the data gathered. The output consisted of the immediate response to a possible / actual incident, analysis after an incident, evidentiary analysis after an incident, conducive place for teaching and learning process and the assessment/evaluation on the survey's outcome.

**STATEMENT OF THE PROBLEM** This study aims to develop a video surveillance system that helps to secure the school of Lucan Central Colleges. Specifically, it sought answer the following questions: 1. What is the current security system used by Lucan Central Colleges? 2. What features of the existing video surveillance system that can be fused into one composite system? 3. How does the system works in terms of: a. Efficiency b. Maintainability c. Functionality

**SCOPE AND DELIMITATION OF THE STUDY** This study focused on the security system of the individuals in schools by having a defense security system using video surveillance. This study, intended for a non-expert audience, discusses the ins and outs of this technology and tries to characterize the market it represents, not for different places, but more specifically limited area in our schools. It contains information on video surveillance technology, its application, and leading edge video analytic techniques applicable to it, its needs, the developments and trends in this field, the issues it raises, and the supply and demand it generates. Furthermore it only attempted to identify the needs of the group concerned, explanations or reasons for these needs were not concerns of this study.

**SIGNIFICANCE OF THE STUDY** The study is deemed beneficial to the following: Students. This analysis/ research

will help the students to feel safe inside the school; they can concentrate/focus on their studies without bothering on what could possibly happen to them while they are in the school vicinity. With the help of this study the security of the students inside the campus will be intensively monitored by the use of the security system installed within the school campus. Students may be less inclined to cause trouble because of the solid documentation that the video recordings provide. School Administrators / Universities. When school campuses provide a video surveillance with sms and mms support system for their security, it will become a peaceful, conducive and friendly school environment. It will maintain the peace of mind of the School administrators or staff inside the school campus. School will easily secure the safety of the students enrolled. Another thing is video surveillance with sms and mms support system will help the school officials to find the performance evaluation of their employee. This system will also use to lessen or decrease the property damages such as vandalism and theft; far too often the administration can only react to vandalism with time-consuming, seldom successful and often fruitless attempts to identify the perpetrators. Researcher. This study serves as a major part of the course requirement as it has developed their skills in terms of self-esteem, time management, practicality, strategic planning and patience. Hence, they are able to obtain the necessary information on time and reporting it in the most presentable manner they can. This study can be effective tool for reference to know how to make the schools safer. DEFINITION OF TERMS To understand and clarify the terms used in the study, the following are hereby defined: Video Surveillance. Is the monitoring of the behavior, activities, or

other changing information, usually of people and often in a surreptitious manner. It most usually refers to observation of individuals or groups by government organizations. Security System. A system that enforces boundaries between computer networks. It is an electrical device that sets off an alarm when someone tries to break in IP Network. Is a computer network made of devices that support the Internet Protocol. Monitor. A device that displays images or symbols generated by computers. Law Enforcement Officer. Is any public-sector employee or agent whose duties involve the enforcement of laws. Vandalism. Is the behavior attributed originally to the Vandals, by the Romans, in respect of culture: ruthless destruction or spoiling of anything beautiful or venerable. Such action includes defacement, graffiti and criminal damage. Theft. Is the illegal taking of another person's property without that person's freely-given consent. The word is also used as an informal shorthand term for some crimes against property, such as burglary, embezzlement, larceny, looting, robbery, shoplifting, fraud and sometimes criminal conversion. Algorithm. Is an effective method for solving a problem expressed as a finite sequence of instructions. Algorithms are used for calculation, data processing, and many other fields. Thermal Scanner. A thermal scanner takes a measurement of the reflection of electromagnetic energy emitted in the infrared spectrum. It has the ability to sense differences in temperatures of known objects. X-ray. Is a form of electromagnetic radiation. It can penetrate solid objects and their largest use is to take images of the inside of objects in diagnostic radiography and crystallography. Monitoring. The act of observing something (and sometimes keeping a record of it). Camera. Equipment for taking

photographs. Surveillance Camera . " Surveillance" comes from a French word that means " to watch over;" camera surveillance uses photography to watch over people in public spaces. CCTV. Closed-circuit television (CCTV) is the use of video cameras to transmit a signal to a specific place. CHAPTER II REVIEW OF RELATED LITERATURE Foreign Studies Many European countries now employ public video surveillance as a primary tool to monitor population movements and to prevent terrorism. The United Kingdom (UK) in particular relies extensively on video surveillance as a tool to fight crime and prevent terrorism. According to some researchers, the camera surveillance systems in the UK are discouraging and thus preventing crime. Public video surveillance in the UK began very unassumingly in 1986, on a single square mile industrial estate outside the English town of King's Lynn. Three CCTV video surveillance cameras were used and their impact was immediate. In the years before the cameras were installed, there had been 58 crimes (mostly vandalism) recorded on the estate. In the two years following the installation, there were no crimes reported. Subsequently, cities and towns across Great Britain began using this crime prevention measure. By 1994, over 300 jurisdictions in the country had installed some form of public video surveillance. In 1995, the national government made available up to \$3. 1 million in matching grants available to cities and towns to establish CCTV video surveillance programs. According to the police superintendent of a large metropolitan area, " public video surveillance has been very helpful in making arrests, and perhaps more important, helping to allocate resources to where they're most necessary." Although most municipal systems have been operational since 1990, there is little longitudinal data indicating how

effective CCTV surveillance systems actually have been in reducing crime rates. Recent British government reports cite CCTV surveillance as a major reason for declining crime rates: in the small town of Berwick burglaries fell by 69 percent; in Northampton overall crime decreased by 57 percent; and in Glasgow, Scotland crime decreased by 68 percent. An increasing number of American cities and towns are currently investing millions of taxpayer dollars in surveillance camera systems. But few are closely examining the costs and benefits of those investments, or creating mechanisms for measuring those costs and benefits over time. There is extensive academic literature on the subject—studies carried out over many years—and that research strongly indicates that video surveillance has no statistically significant effect on crime rates. The principle studies on video surveillance have been conducted in the UK, where surveillance cameras are pervasive. Those studies, which have been commissioned by the British Home Office, have found varying results when they look at individual camera sites in isolation. However, the best studies combine results from multiple camera sites in a meta-analysis, which eliminates anomalies. The two main meta-analyses conducted for the British Home Office show that video surveillance has no impact on crime whatsoever. Video surveillance systems are more disparate and at various levels of operability in the United States. As such, fewer independent studies of their efficacy exist. However, preliminary studies of surveillance cameras in California show similar results to studies conducted in the UK: Cameras having little to no effect on crime reduction. This White Paper is based on a literature review of major studies of video surveillance from 2000 to 2008. It examines the key meta-analyses from the

UK, discusses the major difficulties in determining the impact of video surveillance on crime, and describes preliminary studies conducted in the US. The major findings of these studies should, at a minimum, be part of the debate around surveillance cameras. An increasing number of American cities and towns are currently investing millions of taxpayer dollars in surveillance camera systems. But few are closely examining the costs and benefits of those investments, or creating mechanisms for measuring those costs and benefits over time. There is extensive academic literature on the subject—studies carried out over many years—and that research strongly indicates the following: - Meta-analyses (studies that average the results of multiple studies) in the UK show that video surveillance has no statistically significant impact on crime. - Preliminary studies on video surveillance systems in the US show little to no positive impact on crime. The major findings of these studies should, at a minimum, be part of the debate around surveillance cameras. This White Paper is based upon a literature review of independent studies on the effect of video surveillance on crime rates from 2000 to 2008, particularly meta-analyses that aggregate data from several studies. It surveys what these meta-analyses have found, the methodological difficulties of studying video surveillance systems in isolation, and preliminary results from studies in the US. DIFFICULTIES OF STUDYING SURVEILLANCE SYSTEMS Several factors in particular make it difficult to assess the effectiveness of surveillance cameras: Displacement.

Displacement complicates attempts to measure the impact of surveillance cameras on crime rates, because it means that the control area cannot be too close in proximity to the cameras. For example, in looking at a downtown



district and comparing the number of muggings on particular blocks, one might reasonably assume Measuring the success of public video surveillance systems is complex, because there are always innumerable factors that can explain a rise or fall in crime rates. Simply showing an increase or decrease in reported crime in an area under surveillance does not take into account general trends in crime and crime reporting, additional police in the areas under surveillance, better lighting, and perhaps most importantly, the possible displacement of crime to other areas not under surveillance. that if the rate of muggings increase near an area that is being monitored by cameras, and decrease in the area being directly monitored, then the cameras have been effective in reducing muggings. However, it could also be reasonably assumed that the placement of the cameras on a particular block in fact pushed the muggings into surrounding areas, and did not reduce crime overall. This is really a problem of interpretation, not data, and as a result, displacement can be extraordinarily difficult to show.

Confounding variables. It can be inaccurate to extrapolate success from specific locations to general areas. For example, enclosed places such as parking lots tend to produce better outcomes than outdoor areas. In addition, other factors such as increased police presence and better lighting in areas under surveillance make it difficult to conclude which intervention is most effective. It is unclear in many studies that appear to show success whether surveillance cameras had a positive impact in combination with improved lighting, or whether the improved lighting might accomplish the positive outcome on its own. Studies vary on the degree to which they take confounding factors into account. Because of these problems, individual

video surveillance studies may not be reliable on their own. In evaluating the merits of video surveillance it is important to look at the overall trend of multiple studies and place particular reliance on studies with rigorous methodology. For this reason, the UK Home Office has adopted the meta-analysis as the best statistical tool for studying the efficacy of surveillance cameras. META-ANALYSES OF UNITED KINGDOM SURVEILLANCE SYSTEMS

The efficacy of public video surveillance as a crime-fighting tool has been analyzed in a wide range of studies over the last decade. The majority of research has been conducted in the United Kingdom, which more than any other country has embraced the widespread use of cameras. The UK's network of public surveillance cameras is the largest in the world (although China is quickly outpacing it). 1 The number of surveillance cameras in England and Wales increased from 100 in 1990 to 40, 000 in 2002, 2 and now stands above 4. 2 million, or one for every 14 persons. 3 The center of London is surrounded by a " ring of steel, " a networked video surveillance system that is intended to allow law enforcement to track individuals moving through the city, observe patterns of behavior and respond immediately to threats. The British Home Office, the agency in charge of security, spent 78% of its criminal justice budget in the 1990's on surveillance cameras, 4 and is estimated to have spent over £500 million (approximately a \$1 billion) in between 1995 and 2005. 5 The Home Office has commissioned several key studies on the effectiveness of these systems around the UK using meta-analysis. Meta-analysis combines the results of multiple studies that all have similar hypotheses and methodological criteria. This is important because it weeds out anomalies. For example, one installation of a video surveillance

system might coincide with a sharp drop in crime, but we cannot know whether it caused the drop without comparing it to other scenarios (further explanation of the difficulty of measuring success from isolated studies is below). A meta-analysis can provide a clearer sense of the impact of surveillance cameras by taking a variety of studies and averaging their results. The individual studies show moderate successes in some sites, usually in parking lots, and for certain types of crimes, usually vehicle crimes. However, the majority of studies show no effect on overall crime, and when combined in a meta-analysis, CCTV is shown to have no statistically significant impact on crime rates at all. The following is a summary of the Home Office studies.

Home Office Study, 2002 In the first Home Office study in August 2002, Brandon C. Welsh and David P. Farrington<sup>6</sup> surveyed 22 studies of CCTV (both in the UK and the USA) for a meta-analysis, and found that, taken together, the cameras had no significant impact on crime. Welsh and Farrington began with 46 studies, but whittled the number down to 18 based on the criteria for inclusion in the meta-analysis. 7 Of the 18 studies, half showed some reduction in crime in the area under surveillance, about a quarter showed an increase in crime, and the remaining studies showed a null effect. Welsh and Farrington then created a meta-analysis for the included studies, by determining an odds-ratio for each study and then combining these ratios. An odds-ratio is a numerical expression of the net effect of an intervention, calculated by comparing results in the experimental area with the control. An odds-ratio of 1 shows that there is no difference in crime rates between the experimental (surveilled) area and the control. An odds-ratio greater than 1 shows that the areas with cameras are

experiencing less crime than the control areas. An odds-ratio of less than 1 show that the areas with cameras are experiencing more crime than the control. When Welsh and Farrington combined odd-ratios for all 18 studies included in the meta-analysis, they found that the average was just over 1, showing a very small impact on crime, and when measured against the standard deviation, this impact was shown to be statistically insignificant. The areas with cameras did not perform better than the areas without. It is worth noting that the two areas included in which cameras were the only intervention used (no added police presence, increased lighting, etc.) showed no effect on crime in one case, 8 and an increase in crime in the other. 9 Five of the eleven studies that showed reductions in crime looked at camera systems located in enclosed parking lots. These studies showed an overall odds-ratio of 1. 7, but included other interventions, such as improved lighting, fencing, notices about CCTV, and increased security personnel. This suggests that cameras can be effective when used in specific environments and combined with other preventative measures. Home Office Study, 2005 Criminologists Martin Gill and Angela Spriggs published a comprehensive analysis of fourteen individual sites in the UK for the Home Office in 2005, 10 which found, again through the use of meta-analysis, that the cameras had “no overall effect” on crime rates. Gill and Spriggs concluded that only one of 13 sites showed a statistically significant reduction in crime (one site was excluded for failing to meet the crime statistics recording criteria). This site showed a reduction far larger than any others—an odds-ratio of 3. 34, indicating a reduction in crime of over 300%, compared with the second-largest odds-ratio of 1. 38, or just under 40%—and was also the most

expensive site, at a cost of over £3 million (about \$6 million) for the camera system. This area also experienced several confounding factors including increased fencing and improvements to security, though these were implemented once the video surveillance system was fully installed and thus may not have had a distorting impact on the outcome. Although Gill and Spriggs' analysis found " that CCTV schemes produced no overall effect on all relevant crime viewed collectively,"<sup>11</sup> the study did show overall better outcomes for vehicle crimes in seven of the sites. Violent crimes were different. In the four urban city centers included in the study, violence against persons increased in three sites. Gill and Spriggs hypothesize that these crimes may be impulsive and more often influenced by alcohol.<sup>12</sup> They also acknowledge that changes to parking regulations in at least one site may have contributed to the reduction in vehicle crime, by simply reducing the number of vehicles on the street.<sup>13</sup> In addition, burglary, a property crime that did show reductions in one site, showed the highest rate of displacement in an area adjacent to the target area.<sup>14</sup> Gill and Spriggs additionally found that fear of being victimized by crime did not change significantly from before the cameras were installed and after, though 69-96% of individuals surveyed in the 14 sites responded favorably to plans to install camera systems.

PRELIMINARY USA STUDIES SHOW LITTLE POSITIVE IMPACT Fewer studies of video surveillance have been conducted in the United States, where cameras have been erected in a piecemeal manner, and have not undergone an extensive process of networking though Chicago<sup>15</sup> and New York<sup>16</sup> are beginning this process). Studies are, at this point, insufficient to conduct meta-analyses based solely on studies in the

US. However, Welsh and Farrington's 2002 meta-analysis compared UK and US sites, and the two revisited this comparison in a 2004 follow-up. 17 The American studies that met the criteria for the meta-analysis generally showed worse outcomes than those in the UK, showing an undesirable or null effect on crime. Welsh and Farrington point out a few key differences between the UK and US systems that might explain this. One possibility is a difference in reporting time, with the UK studies generally taking longer to report findings. However, as Welsh and Farrington report, what is likely an even more important factor, is that the surveillance sites in the US lack the confounding elements of the British sites. While nine of the 14 UK sites used several different interventions simultaneously, such as improved lighting and increased foot patrols, none of the US schemes used any intervention besides cameras. Thus, these studies provide a more unadulterated look at the effect of surveillance cameras on crime rates than their UK counterparts and show that cameras on their own have virtually no impact on crime. 18

The following are two initial independent studies of small-scale systems, both in California, 19 that offer a preliminary view of the impact of video surveillance on crime in US cities. UC Berkeley Preliminary Study The city of San Francisco's 68 cameras appear to have had a small impact on property crimes, but no impact on violent crimes. Jennifer King and colleagues at Center for Information Technology Research in the Interest of Society (CITRIS) and the Samuelson Clinic at the University of California, Berkeley, are currently in the process of studying the impact of San Francisco's small video surveillance system. In March 2008, they published preliminary findings. 20 Looking at aggregate statistics on serious violent crime and

serious property crimes before and after installation of cameras in high-crime neighborhoods, King's group found a 22% decline in property crime occurring within 100 feet of the cameras, but no statistically significant changes between 100 and 500 feet from the cameras. This would seem to suggest that the cameras are, in fact, working to reduce property crimes. However, without the benefit of aggregated multiple studies in a meta-analysis, we cannot know whether this reduction is a fluke or not. Regarding violent crime, there appeared to be no statistically significant change in the level of crime anywhere in the 500 foot range around the cameras. When violent crimes were disaggregated, a decline in homicide was observed within 250 feet of the cameras, however this reduction was offset completely by an equal increase in homicides between 250 and 500 feet from the cameras, suggesting displacement. The study also did preliminary analysis of crime statistics 500-1000 feet away from the cameras, and thus, based on information available from the San Francisco Police Department, out of the range of surveillance, and found an increase in property crime between 500 to 750 feet from the cameras. This might suggest displacement from the areas directly monitored by the cameras, though an offsetting decline in property crimes in the area 750 to 1,000 feet away makes a determination of displacement inconclusive. Notably when the preliminary findings of the UC Berkeley study were reported in the San Francisco Chronicle, Supervisor Ross Mirkarimi, who heads the board's public safety committee, responded to the apparent null effect on violent crime by asserting that the cameras provided "psychological relief" to citizens, and were thus justified. <sup>21</sup> The city has so far spent \$900,000 on the 68 cameras currently up and has

budgeted an additional \$200, 000 for 25 more cameras intended to target violent gang activity. 22 USC Study Preliminary studies of camera systems in Los Angeles show no impact on crime. Students at the University of Southern California School of Policy, Planning and Development released a report to the California Research Bureau in May 2008 on the effects of video surveillance on crime in two areas of Los Angeles. 23 The group looked at five out of 14 cameras along a high-traffic section of Hollywood Blvd. and six cameras at the Jordan Downs Public Housing Project in Watts. The study notes that, unlike San Francisco's public video surveillance system, cameras in Los Angeles have not been analyzed by the city or some other official body to determine their efficacy. This may be because while San Francisco has incurred substantial costs for installation and upkeep of the cameras, many of LA's cameras, including the clusters that the USC group examined, were installed through private donations (on Hollywood Blvd, for example, the cameras were donated to the city by the film industry) or federal grants through the US Department of Homeland Security's Grant Program. Another important distinction between the camera systems in Los Angeles and those in San Francisco is active monitoring of LA's cameras " in real time, " vs. a decision by the San Francisco City Council to allow only passive monitoring of the cameras for the purposes of safeguarding citizens' privacy. Looking at the LAPD's COMPSTAT figures to determine pre and post installation crime rates, as well as arrest records, the study found no significant impact on crime in either area. Violent crime went down in both areas, but that reduction was offset by an overall crime reduction in surrounding control areas (though in the case of the Jordan Downs Housing Project, the group



hypothesized that the cameras may have played a role in preventing a substantial escalation of crime relative to surrounding areas, since the housing project was the site of a gang war during the period of the study). The group was not able to find statistically significant evidence of displacement in either area.

**Local Literature** The Philippines is known as the Pearl of the Orient, with its exotic and tropical islands, rare and valuable natural resources, stunning natural wonders, warm and hospitable people, and rising national status in the world. But with all these raves, the country is not exempt from the terrors of the rest of the world. Despite its beauty, the country is also in danger of relentless terrorist threats and terrorism incidences. Communications and Information Technology industries are also booming and the workplace is getting larger and more complex as time progresses. The country is not bereft of crimes, in the cities, suburbs, and rural areas. The fact is that this is the harsh reality that goes hand in hand with the wonders and delight the country can offer. But the good side to this is that we are not left helpless to these looming possibilities of insecurity. You have the choice of taking a proactive stance when it comes to securing your homes, your businesses, your country, and your future. Philippine Security brings you the latest and most reliable storage and security system technologies that can take your safety and security confidence to a higher level. Only Philippine Security offers the complete set of security solutions that can meet the security needs of various types of clients — from the government, to the business sector, to academic institutions, to individual homes and to the schools and campuses. Our line-up of products and solutions include the top-of-the-line surveillance cameras, access control and

alarm systems. Chapter 3 Research Methodology This chapter presents the methodology of the study. This involves the discussion of the research methods, project design, project development, operation and testing procedure and evaluation procedure. Research Method This study will use the developmental research method as the use of video for surveillance increases, there remains a need to automate and improve these systems, not only to decrease the amount of manpower required to operate surveillance systems, but also to increase their capability. This article details the evolution and improvement of extracting " moving" objects from an original digital video input, such as an AVI or MPEG file. Developing and simulating various algorithms used to automate motion detection in digital video. As the capabilities of video surveillance increase, the systems will not only rely on improving hardware, such as processor speed and memory size, but also the use of intelligent computing. Permission to conduct the study will be secured by the researcher from the school administrator of Mrs. Remedios Suaren in Lucan Central Colleges, Pagadian City. After which, the researcher will go to the school under study to personally implement to the students and teachers who has a knowledge or familiarity about the Video Surveillance with SMS and MMS Support System. The information gathered were tabulated and processed with the aid of computer to determine the precise interpretation of the results. Data were collated, tabulated, and analyzed. The respondents of the study will be the students and faculties of Lucan Central Colleges, Pagadian City. Project Design In our project surveillance footage will be accessible thru the Internet. A system will be setup with options and features the group decides to be helpful. Security

Cameras are literally the eyes of a video surveillance with sms and mms support system. Cameras should be deployed in critical areas to capture relevant video. Its goal is to quickly identify the key aspects of video surveillance design, not to examine the many details and edge cases in such designs. The idea of the SECURITY project is to design and develop teleinformatic tools that would supplement the functions of already existing audio and video surveillance with sms and mms support systems. This extension is a function of automatic image and sound interpretation, which lets computer systems automatically discover potential threats and generate alerts to appropriate services responsible for public order and security.

Figure 2 in this page shows the General System Architectural Design of Video Surveillance with SMS and MMS Support System Software of Lucan Central Colleges, Pagadian City which displays the resulting “ design documents” and describes how the system really works. Thus the Video Surveillance Software carries all the responsibilities for security of all the documents, processes/steps and outcome of the software taken. Figure 2. General System Architecture Design Project Development In developing a project or software must be easy, straightforward, and highly productive. This dissertation explores the development of purpose in the project definition phase of construction projects. My research focuses on how project management action supports the effective development of project purpose. To understand more fully how project management can help define project purpose we must examine the current theory of purpose development. Figure 3. Project Development Life Cycle Figure 3 illustrates the flow of the software development life cycle for software engineering. The project

development life cycle is sometimes called the “ waterfall model”. It demands a systematic, sequential approach to project development that begins at the system level and progresses through analysis, design, coding and testing. The overall goal of the project is to build an integrated system which can meet all requirements needed in this particular system implemented. The project development life cycle paradigm encompasses the following activities: 1. Project Planning. It is problem-solving activity in which the desired functions of video surveillance system are uncovered, analyzed and allocated to individual system elements. Project planning involves a series of steps that determine how to achieve a particular functions or set of related goals. This goal can be identified in a system plan or a strategic plan. The researcher considered some questions in analyzing the project. 1. 1 What are you trying to accomplish by installing a video surveillance with sms and mms support system? 1. 2 What types of facilities are you monitoring? 1. 3 What is the quality of the images that you require? 1. 4 How long do you need to keep recordings? 1. 5 How much storage do I need for my video system? 2. Project requirement analysis and data gathering is a project task to bridge the communication gap between respondents and the researcher. The researcher attempted to gather information through a proper meeting and interviews and raised possible questions related to the processes involve and transactions that need to be automated. Key Activities undertaken by the researcher are the following: \* Identify all equipment requirements and sources for the system. \* Built trust and harmony to the respondents A. Hardware requirements including network connection layout. a. Hardware Requirements 1 computer unit Specification: 1. Main Processor -1. 5

Gigahertz 2. Motherboard -O. E. M. 3. Hard Disk -500 Gigabytes 4. Cell phone Model -Have MMS model type 5. Type of Modem (USB or PLUG —IT) -Smart Bro Modem 6. Monitor (LCD/LED) -LCD Monitor 7. Speaker -PC Speaker 8. Camera Model -Q-30 model 9. Memory -2038 Megabytes B. Software requirements 1. Video Surveillance with SMS and MMS Support System 2. OS (Windows XP) 3. Motherboard drivers 4. Video Drivers (if necessary) 5. Camera Driver 6. Audio Card Adapter 3. DESIGN is a process of applying various techniques and principles for the purpose of defining processes, which involve in the system study in sufficient detail to permit its physical realization. During design phase, the researcher integrates all requirements and gathered information and converting it into representation to reach its goal and project quality assurance. 4. CODING is a task that translates a detailed design representation of the project into a programming language realization and converting it into form that can be understood by the computer. The researcher used “ Visual Basic Programming Language” as vehicle and a tool for communication between human or the user and the computer hardware. In this phase, instructions and commands formulas, conditional structure, conditional based selection, logical comparison between variables and logical conditions were being written by the programmer/researcher to reach the expected correct output. 5. TESTING. After the researcher generated a code or a set of instructions telling the computer to do a specific task, the testing process begins. Project testing is critical element of project quality assurance and represents the ultimate review of specification, design and coding. The objectives of testing the admission and enrollment software are included in the finding of errors and

uncovering the undiscovered errors. When error occurs, the researcher goes back to coding and modifies instruction and logical conditions of the entire project to ensure and reached the expected results. 6. DOCUMENTATION.

The Researchers filled all the information completely from the beginning of the study until the completion. The researchers will then compiled all the chapters and procedure a hardbound copy. TESTING OPERATION AND PROCEDURES Before its operation, there was a demonstration, proper testing and evaluation of the software system. The task of software developer was to ensure high-quality software assurance with emphasis along its functionality, reliability, usability, efficiency, maintainability and portability. These software characteristics can only be met by means of a thorough testing. It was implemented with the sole users of the software project. Testing is a demonstration which purpose is to find faults. Fault is a standard terminology in information technology for what is popularly called a bug, whereas a failure is the observed incorrect behavior of " Automated Students' Record Management System" as consequences of faults in which the error is the mistake made by the programmer/researcher. This testing procedure is called an " Execution-Based Testing". Execution-Based Testing is a process of inferring certain behavioral properties of software based, in part, on the results of executing the software in a known environment with selected inputs. The operation and testing procedure are divided into different parts namely: \* Hardware requirements including network connections layout. \* Software requirements \* Software testing procedure The hardware and software requirements of this system are based to the minimum requirement. The system is found functional if the end user tries to

use components that are higher than the requirements. Lower than the components required may cause system failure. Evaluation Procedure The Video Surveillance with SMS and MMS Support System was evaluated carefully by the respondents were Information Technology expert and sole user was the main concern such as installing and managing the software project. Chapter 4 Results and Discussion This Chapter presents the flow of the existing and proposed video surveillance system procedures of Lucan Central Colleges. A comparison of existing software features adopted in some other countries and features of the proposed Video Surveillance Software made. Entity relational Diagram, Project Description and the detailed discussion about the structural design of the project are discussed. Problem No. 1 What is the current security system used by Lucan Central Colleges? Answer: Lucan Central Colleges used manual monitoring on stealing, unidentified/suspicious movement especially during nighttime. Steps in setting up a PC Video Surveillance Camera Confirm you have bought all for the systems, Including Security camera, housing, bracket, Monitor and accessories such as video cable, plug, power adapter, enough screws, BNC connectors, and the Software which is the Video Surveillance with SMS and MMS Support System. Steps: 1. Select a camera location near the target area. 2. Confirm your systems come with plug and play power and video cables. Connect one end of the cable directly to the camera and connect the other end of the cable to the Computer and the plug-in power adapter. 3. (Optional) For remote video monitoring over the web, connect the network cable from your high speed modem to the DVR. 4. Turn on your system and begin monitoring your home or business or in school. EXISTING VIDEO

SURVEILLANCE PROCEDURE TURN ON YOUR SYSTEM AND BEGIN MONITORING (OPTIONAL) CONNECT THE NETWORK CABLE FROM HIGH SPEED MODEM CONNECT ONE END OF THE CABLE DIRECTLY TO THE CAMERA and ONE END OF THE CABLE DIRECTLY TO THE COMPUTER SETUP & SELECT A CAMERA LOCATION Figure 4. Steps in Video Surveillance Setup The steps of setting up the Video Surveillance with SMS and MMS Support System must be followed during installations. First, select your area target where the camera locate and place it in a proper position. Connect each cable to the directly to the camera and the other end must be connected to your PC. Optional, for remote video monitoring over the web, connect the network cable from your high speed modem and then turn on your system and begin monitoring your home or in school. PROPOSED VIDEO OUTPUT PROCEDURE Below is the proposed video process during the system running processes. The proposed system intends to improve the existing surveillance process. The figure below shows the proposed Video Surveillance and its processes and procedure applied by Lucan Central Colleges, Pagadian City. MOTION OF OBJECT DETECTION SAVE THE CAPTURED OBJECT IN THE COMPUTER SEND NOTICE TO THE OWNER AFTER DETECTION THROUGH INTERNET RECEIVING THE WARNING SMS or MMS via INTERNET TO THE OWNER Figure 5. Proposed Video Output Procedure The proposed surveillance via internet procedures is more applicable in this project. The steps to be followed during the process are shortened. All steps are mentioned are possible outcome of the system. First, the system detected motion, after detecting the object, it captured image automatically saves to the computer, and then it sends the image captured via internet using the modem installed to your PC, after that the



final result is the receiving of warning text to the owner of the security system which he/she determine that there is an intruder detected in your private place. Refer to the example below. Figure 6. Sample Video Surveillance Output This system is said to be case sensitive. Because every motion detected, will be captured and place to the system. Figure 6 above shows the sample output of the video surveillance. That images captured by the system through camera will then be send to the owner via internet. Table 4. Below shows the comparison of functionalities from the surveillance system from setting up of the camera into sending SMS or MMS into the owner. As described in the table that there are steps to be taken by the system during the monitoring of the system process. The estimated time to complete the process is 20 minutes from the existing flow to proposed flow of the system. These 15 minutes are the overall time of the existing flow, while in the proposed flow of the video output are consuming only 5 minutes. There are only four (4) steps to follow the required flow. And it is within the availability of the security personnel to specify the total or overall time needed for the system.

EXISTING FLOW	ESTIMATED TIME	PROPOSED FLOW	ESTIMATED TIME
1. Setting up the surveillance system & selecting location target.	10 minutes	1. Motion of Object detection.	3 minutes
2. Connecting one end cable directly to the camera and the other end is from your PC.	3 minutes	2. Save the captured object.	1 minutes
3. (Optional) Connecting network cable.	1 minutes	3. Sending notice to the owner.	1 minutes
4. Turn on the system.	1 minutes	4. Receiving the warning notice via internet.	30 seconds
<b>Total</b>	<b>15 minutes</b>	<b>Total</b>	<b>5 minutes</b>

Table 4. Comparison of existing and proposed system.

of the existing video surveillance system that can be fused into one composite system. Answer: The Figure below illustrates the existing system features of video surveillance with sms and mms support system. Video Surveillance with SMS and MMS Support System Features 1. User Friendly 2. Easy to use 3. Auto Detect Motion with Alarm Sound 4. Can Send SMS or MMS warning through internet Problem No. 3. How does the system works in terms of: b. Efficiency c. Maintainability d. Functionality Chapter 5 Summary, Findings, Conclusion and Recommendation Summary SUMMARY The main objective of this research study was to make a developmental research method about the technology implicated in using Video Surveillance with SMS and MMS Support System in Lucan Central Colleges, Corner Alano and Cabrera Streets, Pagadian City. Specifically, it sought to answer the following questions. \* What are the specific security threats and concerns of the school attempting to address by using a video surveillance system. \* How will it help address those threats and how will the school actually use it on a day-to-day basis. \* How does the school management accept and interpret data produce by the system? \* How does the student accept the new system if implemented? \* Is there a significant difference between the security personnel officer and the video surveillance system? The researcher utilized the developmental research method of this project was used in this study of designing, developing and evaluating computer programs, processes, and products that must meet the criteria of internal consistency and effectiveness. Developmental research was particularly important in the field of information technology. This research involved situation in which the product-development process was analyzed and described, and the final

product was evaluated. Students and Teachers in (LCC) served as the respondents, out of (50) fifty respondents, (32) thirty-two of them are male while the other 18 are female utilized and evaluated the functionality, reliability, usability, efficiency maintainability and portability of the software. To analyze and interpret the data, the study utilized the following statistical tools: Percentage and Likert Scale System. The study reveals the following findings: Majority or 64 percent of the respondents are male and 36 percent are females. Most of the respondents belong to the 21-25 age brackets with a moderate knowledge about the video surveillance system. Findings The following findings were revealed A. The EXISTING VIDEO SURVEILLANCE PROCEDURE in LCC are follows. 1. You must select a camera location near in the target area. 2. Confirm first your systems come with plug and play power and video cables. Connect one end of the cable directly to the camera and connect the other end of the cable to the Computer and the plug-in power adapter. 3. (Optional) For remote video monitoring over the web, connect the network cable from your high speed modem to the DVR. 4. Turn on your system and begin monitoring your home or business. B. The proposed video output procedure eliminated all the steps in the Surveillance System. The following steps were listed below. 1. System motion detection 2. Captured image automatically saves to the computer 3. Sending the warning notice to the owner via internet. 4. Receiving the warning text to the owner via text or internet connection. C. The following are the features of Video Surveillance with SMS or MMS Support System Video Surveillance with SMS and MMS Support System Features 1. User Friendly 2. Easy to use 3. Auto Detect Motion with Alarm Sound 4. Can Send SMS or MMS warning through internet

Conclusion Due to increased terrors and crimes, the use of the video surveillance camera system is increasing. It has been operated for public interest such as prevention of crimes and fly-tipping by the police and local government, but private information such as faces or behavior patterns can be recorded in CCTV. When the recorded video data is exposed, it may cause an invasion to privacy and crimes. This paper analyses conventional methods of privacy protection in surveillance camera systems and applied scrambling and RFID system to existing surveillance systems to prevent privacy exposure in monitoring simultaneously for both privacy protection and surveillance. The proposed system adjusts the intensities of privacy according to access levels to reduce invasion of privacy by people who are not concerned. RECOMMENDATION Video surveillance should only be considered where less intrusive means of deterrence, such as increased monitoring by teachers, have shown to be ineffective or unworkable. In its consultation with the school community, the school administration should outline the less intrusive means that have been considered and the reason why they are not effective. Before implementing a video surveillance program, a school should be able to demonstrate. Video surveillance programs should only be adopted where circumstances have shown that it is necessary for the purposes of providing the safety of students and staff, or for the deterrence of destructive acts, such as vandalism. The school administration should provide justification for the use and extent of a video surveillance program on the basis of addressing specific and significant concerns about safety and/or the theft or destruction of property. They should also conduct an assessment into the effects that the surveillance

system will have on personal privacy and the ways in which such adverse effects may be mitigated. They should consult openly with parents, staff, students and the broader school community as to the necessity of the proposed video surveillance program and its acceptability to the school community. Consultation should provide stakeholders with an opportunity to comment on the actual location of cameras on school property, should the project proceed and they should ensure that the proposed design and operat