An Empirical Study on CCTV Surveillance and Women Security

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Abstract— CCTV cameras prevent crime from occurring and minimize its levels where they cannot be completely eliminated. Crime was reduced by over 51% by the cameras in United Kingdom casinos and parking lots when tested for their effectiveness in preventing theft and crimes. In the majority of cases, criminals who attempt to commit crimes with the cameras are convicted in court after having evidence of their crimes Cameras provide evidence of crime, enabling the tracking of criminals to be easier. Due to the difficulty of proving crimes in many countries, many criminals avoided prosecution for their crimes, which encouraged more criminal activity. In the present study, the purpose is to obtain an understanding of the purposes attached to surveillance and its effectiveness in enhancing security and safety among women in Orissa, as well as what measures can be taken to increase their feelings of safety and security.

Keywords— CCTV Surveillance, Women security and safety.

I. INTRODUCTION

Using an array of surveillance monitors, closed-circuit television monitors a specific area using video cameras. It is mainly done in banks, supermarkets, casinos, airports, military institutions, and convenience stores that video cameras are used as CCTV cameras, if they are high definition cameras for accurate monitoring. Where crime cannot be eradicated completely, cameras prevent it from occurring and reduce its level [1]. In many parts of America, Europe, and Asia, CCTV surveillance has proven to be one of the most effective methods for preventing crime due to the fact that criminal cases decreased proportionately as the number of cameras increased. When people stopped using them, they quickly returned to the old ways [2]. Crimes from the past started resurfacing and so people's faith in cameras began to wane. This paper examines how effectively CCTV can be used in criminal cases in order to determine its relevance and benefits.

CCTVs are best suited for reducing and preventing crime through alarm notification. Most stores where surveillance security is applied have specific and clearly defined commodities or areas covered [3]. A security personnel can trigger an alarm notification if a criminal moves toward the main item or area of focus. Sensors that detect deviations from a program are used in this kind of protection. Alarms must be able to be triggered by movement and activity within a particular area. Due to the easy integration of breaking attempts into many alarm programs, glass items are the most secure since they can be connected automatically to an alarm. As soon as a break attempt is made, the alarm goes off, allowing all the security personnel to be alerted and react quicker. Using the automated alarm notification to prevent crimes from arising in short intervals, security cannot miss the attention of the protection due to its attention demand and command.

In reducing and preventing crime, the psychological impact of surveillance is the most important factor. CCTV protection helps people remember their security measures easily, as it serves to remind them about them [4]. People understand psychologically that areas under surveillance would appear insecure if the security weren't in place. Through psychological prevention, CCTV can influence potential victims to take more precautions when walking, working, or operating in protected areas [5]. Criminals may also be discouraged from committing crimes in places that appear secure. Before Brazil's trains began using CCTV cameras, criminals felt no pressure to commit crimes against the passengers.

The cases disappeared immediately after CCTVs came into force. A criminal understands that any evidence beyond doubt that identifies his or her activities may lead to a court case. Due to their experience, they also know that CCTVs provide the maximum evidence of any crime in the area [6] . As the authorities are easily able to catch criminals, the criminals fear carrying out their activities. The criminals are therefore psychologically affected by CCTVs, causing them to stop their criminal activities.

In the first place, crime occurs because people are afraid of committing crimes. Those who live in unsafe areas tend to believe that they might be attacked by criminals at any moment. As a result of CCTVs, fear is eradicated among the people

thus preventing crimes from occurring [7] Due to the presence of surveillance systems, the residents perceive these areas to be safer than the areas without surveillance, resulting in a greater number of people visiting the protected areas compared to the unprotected areas. In a particular place, as more people gather, the number of criminal activities decreases, since there are more witnesses in the event of a crime [8]. The CCTV presence can only be effective in deterring crime when it comes to targeting specific people in large crowds.

Despite their ineffectiveness in preventing crime, CCTVs are praised for their proven ability to protect the public [9]. The use of CCTVs to deter crime may prove challenging for a number of reasons. In the first place, the criminals would be able to easily change their targets. It is possible to seal off all routes for criminal activity by using surveillance cameras, but the cost is too high to justify. An area that is perceived to be prone to crime will probably have security beefed up, and CCTVs will likely be installed [10]. It is easy for criminals to plan new targets for their activities when they see cameras installed at their installation, thus making them difficult to track. It is possible for the leadership to keep changing the targets as long as it appears it is committed to stopping the criminals. Security agents have a harder time catching criminals when they cannot determine where to set traps. The same fact appears to be known to criminals, and they are utilizing it to their advantage.

Monitors may have to be strictly observed if the surveillance area proves to be larger than expected. There are some areas that are difficult to monitor and follow up on with cameras and observers. It seems that the place has more cameras, which makes it difficult to observe or follow the areas. Consequently, it is necessary to observe multiple screens at once. The presence of many people in a large and complicated area can easily lead to confusions and misinterpretations, thus making crime possible. Because there are too many monitors, an individual can hibernate in front of one camera and go unnoticed. It is also possible for advanced crimes in an area to be committed through misinterpretation of signals from different points.

The CCTV system lacks independence, giving criminals a huge loophole if they come in an organized gang. Almost all criminals know CCTVs are powered by electricity, and once the lights dim, it takes a while for them to readjust [11]. By tampering with the power line first, an organized group of criminals can easily commit criminal acts unnoticed. High definition cameras send video signals through straight transmissions to monitor screens. Hacking into signals and manipulating them to facilitate crimes has become easy thanks to modern technology.

It is only CCTV that helps in monitoring crimes, not in eradicating them. Many people wonder what happens when someone commits an intentional crime publicly [12]. Some people are aware of the repercussions of their actions, especially illegal activities, but they still engage in them. Despite providing evidence that the crimes were committed, CCTVs don't deter people from committing them again. Due to their knowledge that they will end up in the trap anyway, they might feel motivated to do more damage. Security agents cannot rely solely on CCTV surveillance for their safety as much as surveillance provides a sense of security in a certain area [13]. Apart from the programmed crimes, some activities do not fall under the definition of criminal activity by advanced CCTVs, especially when they are alarm-programmed. Thus, people can commit crimes and mistakes without the CCTV cameras noticing them and still get away with them.

According to their appearance, CCTV appears to be an effective method of preventing crime. Crime-committers cannot proceed because they risk appearing on the monitor screens and being prosecuted [14] Circumstantial evidence is considered reliable and accurate when CCTVs perform security functions. Furthermore, CCTVs reduce crime by eradicating fear among people, which yields more positive results. Insufficient monitoring can, however, result in enormous setbacks when it comes to CCTV security. The CCTVs show the best security and protection when compared to existing systems, but they should not replace them, but rather supplement them. The number of crimes against women is on the rise in India. There has been an alarming amount of media coverage of these cases. Crimes against women are on the rise in metro and cities in India, reflecting a dangerous trend.

Nirbhaya, a case from 2012, led to the government announcing a slew of measures to ensure women's safety, including judicial and police reform. To deter crimes against women, some efforts were made by state governments and law enforcement agencies following the Justice Verma Committee's recommendations, but more planning and effort is needed. As a matter of urgency, adequate measures must be taken to ensure the safety of women. It is possible to enhance the safety of women with the help of video surveillance technology. During India's Smart Cities and Safe Cities development, women's safety needs to be a major focus of the policy makers. The paper focuses on the following objectives:

- To know the purposes attached to CCTV surveillance and its effectiveness in women security.

- To know the awareness level among women of CCTV in Orissa.
- To know the measures that can be taken to increase women's feelings of security and safety in Orissa.

II. ADVANCEMENTS IN TECHNOLOGY

A. Video Surveillance Technology

With advancements in technology, video surveillance technology can not only provide services to citizens but also contribute to women's safety [15] Whenever women are inside a city, they should be comfortable and safe. In addition to providing real-time monitoring, evaluating situations, and the ability to take appropriate action and monitor the surroundings, video surveillance has become an increasingly important component of the safety and security framework for law enforcement agencies and city councils alike [16] Over the years, video surveillance technology has evolved from analog to IP cameras and now includes Artificial Intelligence (AI) algorithms and Artificial Deep Learning. Law enforcement, victims, and citizens can benefit greatly from Video Surveillance Technology in cases of women's safety and security.

B. Video Surveillance Solution

With video surveillance solutions, you can obtain highly scalable, well-proven network video solutions that deliver outstanding monitoring and surveillance capabilities at a low cost. Crime, violence, and terrorism are all reduced through CCTV-generated enforcement [17]. Using video surveillance to deter crimes is the most effective way to ensure women's safety. It prevents crimes against women on a regular basis. Assaults and harassment against women can be prevented in real time with proactive video surveillance.

C. Video Analytics

Utilizing video analytics, you can identify suspects and catch them by using face recognition software by decoding the video footage and enhancing the functionality of your cameras.

D. Evidence Class Video

Video Surveillance Technology can help to secure the safety of women through proactive monitoring, detection, and defense of any Smart City or Safe City by means of proactive monitoring and real time alerts [18]. Providing evidence class videos can be useful in forensic investigations or in court for display of the incident as it unfolded.

E. Advocacy for Women Safety

Video surveillance in developed countries is under debate due to privacy issues which are cited as main reasons to oppose it [19]. The implementation of video surveillance for women's safety in a highly populated country like India requires careful attention with gender sensitivity. Non-Governmental Organizations (NGOS) and law enforcement agencies may be able to play a crucial role in changing stereotypes and increasing women's empowerment.

F. Supporting Women Safety Tools

Crimes against women cannot be deterred only through video surveillance [20]. Women in crisis situations can benefit from smart measures including GPS switches, emergency panic boxes, and RFID bands. Chilli Powder can also be kept, and martial arts and self-defense techniques can be learned.

G. Pre-Crime Video Surveillance measures

Through video surveillance cameras, women should be able to watch public spaces such as schools, colleges, malls, stations, bus stops, terminals, parks, cinemas, and airports to prevent crime [21].

H. Post -Crime Surveillance measures

Investigating the live video surveillance footage, analyzing it for forensic purposes, classifying it as evidence, storing it in the cloud, and protecting it against theft or vandalism.

I. Laws on CCTV surveillance

Under the Information Technology Act, 2000, CCTV cameras are governed by the Information Technology (Responsible Security Practices and Procedures and Sensitive Personal Data and Information) Rules, 2011. In order to collect, store, and use individuals' personal information under these rules, organizations must obtain their consent. Additionally, organizations

must implement reasonable security practices and procedures to prevent unauthorized access, alteration, disclosure, or destruction of this information.

A number of CCTV camera installations in India have been challenged by individuals and parents and the courts have ruled that such installations violate privacy rights. CCTV cameras in India should be regulated by clear guidelines and specific legislation, and safety and security must be balanced with the privacy rights of individuals. Supreme Court of India decision in 2020 upheld Right to Privacy as a fundamental right under Indian Constitution in case of Justice K.S Puttaswamy (Retd) & Anr v Union of India & Ors [22].

According to the court, the state must protect the data from theft or tampering, and it must disclose the information to citizens as soon as possible.

III. METHODOLOGY

The study has been carried out using both primary and secondary data. Qualitative and quantitative approaches were used in this exploratory study. In a series of interviews conducted throughout the day and at night, 290 women in Orissa completed a questionnaire. Considering the researcher is interested in both qualitative and quantitative research, research on crime and fear should use a mixed method approach. The methodological triangulation strengthens the results of the study and fits within the framework of social constructionism by examining both objective and subjective attitudes.

IV. DATA ANALYSIS

TABLE I.   WOMEN AWARENESS ABOUT CCTV

Purposes	N	Minimum	Maximum	Mean	Std. Deviation
Good Idea	290	1.00	5.00	1.6830	.76334
Help Police	290	1.00	4.00	2 .3030	1.41244
Increased safety	290	1.00	5.00	2 .1179	.82463
Women safer	290	1.00	5.00	2 .1717	.92119
Waste money	290	1.00	5.00	2 .2313	.83228
Crime women	290	1.00	5.00	2 .3491	1 .05417
Civil liberties	290	1.00	5.00	2 .4342	1.1 3614
Victimization	290	1.00	5.00	2.6373	1 .02738
Target groups	290	1.00	5.00	2.6 893	1 .07453
Invade Privacy	290	1.00	5.00	3 .0438	1 .07652

In Table I, we show the mean scores for women's feelings about CCTV statements in Orissa. A strong majority of women (M=1.68, SD=.76) agree that CCTV is a good idea (Table 2). Despite agreeing that CCTV will help the police (M= 2.30, SD= 1.41), women also prefer increased safety (M= 2.11, SD= .824). There is a strong consensus among women that CCTV will make women safer (M= 2.17, SD = .92), that CCTV will not waste money (M= 2.23, SD = .83), and that CCTV will reduce crime against women (M= 2.34, SD =1.05). In addition, respondents agree that women do not mind being observed by cameras (M = 3.04, SD = 1.07), the effect of CCTV on civil liberties is undecided by women (M = 2.43, SD = 1.13), whether CCTV targets groups (M = 2.68, SD = 1.07), and that CCTV does not reduce victimization of women (M = 2.63, SD = 1.02).

TABLE II.   WOMEN FEELING OF SECURITY & SAFETY

Purposes	N	Minimum	Maximum	Mean	Std. Deviation
Police officers	290	1.00	18.00	3.6346	3.78232
Women Police	290	1.00	17.00	4.1822	3.36927
Lighting	290	1.00	17.00	4.7034	2 .39727
Info crime & risks	290	1.00	18.00	4.7687	3 .03163
Early intervention	290	1.00	19.00	5.6258	4.51647
More cctv	290	1.00	18.00	5.7398	3 .54651
Security Poles	290	1.00	18.00	6 .1579	3 .57531
Education	290	1.00	17.00	6 .3245	3. 16161
Taxis	290	1.00	18.00	6 .5645	3 .51174
Juveniles other act	290	1.00	19.00	7.1572	3 .54426

As shown in Table II, women identify things that would improve their safety as being effective in improving their safety. Police officers are the top two choices among women (M=3.63, SD 3.78) and women police officers are the top two choices among men (M=4.18, SD 3.36). Also in the top six responses are lighting (M= 4.70, SD= 2.39), crime prevention and early intervention (M= 4.76, SD= 3.03) and information on crime and risks (M= 5.62, SD= 4.51). The bottom four choices of women who think that cameras and security poles would improve women's safety in Orissa are cameras (M=5.73, SD=3.54), security poles (M=6.65, SD= 3.57), safety education (M=6.32, SD= 3.16) and juveniles and other acts (M= 7.15, SD= 3.54).

V.   CONCLUSION AND SUGGESTIONS

Despite the fact that CCTV cameras are placed on trains and on city streets to reassure us we are not in danger, women do not always see them that way. A CCTV system is often used to gather evidence following an incident, but this technology has some risks that can negatively affect the perception of women's safety and their actual safety. Civil liberties are being violated. What are the reasons for filming innocent people in public places who aren't doing anything wrong. As a next step, they will have them confined to public restrooms. A man who gives up liberty for safety deserves neither" - Ben Franklin. Having cameras everywhere won't deter criminals because all they need is a mask. In the wrong hands, it can be catastrophic. Governments will be able to monitor us, which might not matter right now, but might in the future. Watching us while we live our lives isn't fair. There is no point in using them. Three surveillance cameras recorded a man getting stabbed in New York and leaving him to die. Before the ambulances reached the injured man, he had died. It took two hours for them to get to the hospital. It was impossible to help the man with the surveillance cameras. An open window could be used to watch someone all the time, so that would be a privacy invasion if a person looked through it. It is important for the police to be out on the streets preventing crime. In comparison to having police walking the streets, CCTV cameras are less effective. As a replacement for policing, CCTV cameras are less effective than giving the public a false sense of security. In reality, CCTV cameras do not prevent crime despite what the myth claims. CCTV cameras have a symbolic impact on women's behavior in cities." Even though people indicate that they want CCTV cameras monitoring busy streets and public places. Women and girls report all the time that CCTV cameras can't replace the experience of being around and with other people who care about you. As a result, councils, politicians, and local governments want things that are in conflict with what women and girls see as safe. In addition to short-term solutions (such as cameras), they do not capture all forms of sexual harassment. Technology can be used as a temporary measure while behavior changes are plotted and education programs regarding gender violence are developed. Walking through public spaces at night, particularly for women, will continue to make them feel vulnerable as long as this does not change. An ideal CCTV system is one that allows for live monitoring and response to incidents as they occur. On public transportation, maintenance problems can arise, quality is inconsistent, security footage is not always monitored, and not all cameras work.

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