The role and impact of CCTV operators in contributing to efficient crime prevention: A case study of surveillance operators within the City of Cape Town

By

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DECLARATION

I, **Phelimon Papale,** hereby affirm that I have thoroughly reviewed and comprehended the guidelines about the submission of my LLM in Criminology, Law, and Societydissertation. These guidelines encompass various aspects, such as the permissible length of thedissertation and the prohibition of plagiarism. These regulations are outlined in the official rules of this University. I further assert that my dissertation adheres to all the regulations. By submitting this dissertation electronically, I declare that the entirety of the work contained therein is my own original work and that I am the sole author thereof. The reproduction and publication of the work by the University of Cape Town will not infringe any third-party rights,and I have not previously submitted the work with the goal of obtaining any other qualification.

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DEDICATION

This thesis is dedicated to the cherished memory of my late father, Patrick Phetole Papale. His unwavering support, wisdom, and motivation provided invaluable sources of guidance during my scholarly pursuit. Despite his physical absence, his enduring influence continues to serve as a source of inspiration, for which I will be eternally grateful.

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I experience a profound sense of longing for your presence. With this dissertation, I pay tribute to your enduring impact.

With all my love,

ABSTRACT

It is widely recognised that technology has become a critical tool in the business of crime control and prevention. The main purposes of closed-circuit television (CCTV are the detection and deterrence of crime in pursuit of public safety and security. Highways, shopping centres, workplaces, and public transportation systems are all frequent sites for CCTV surveillance. However, studies have consistently fallen short in examining the role and responsibilities of CCTV operators in attempts to detect and deter crime via surveillance systems. Any assertions concerning the overall effectiveness of CCTV cameras, especially when doing proactive real-time monitoring, depend on how the cameras are operated, controlled, and monitored by human agents. This minor dissertation explores the views and experiences of CCTV operators regarding their role and functions in contributing to crime detection and prevention.

The research explored the routine responsibilities of operators, how they perceive their role in the quest for community safety and the challenges related to their work environment. Utilising a qualitative research approach, face-to-face interviews were held with a sample of 15 CCTV operators from the City of Cape Town CCTV Control Centres. Thematic analysis guided data analysis. The findings revealed that most CCVT operators understood their role as monitoring and detecting unlawful actions and, in doing so, enhancing community safety. Such actions are performed through live recordings, proactive monitoring, and reacting to identified safety threats. Several occupational challenges impacting their everyday work were identified. These included technical and social challenges related to the work of CCTV operators, as well as poor relations with the South African Police Service. By way of conclusion, some recommendations are offered to improve the working environment of CCTV operators and address cognitive challenges.

Keywords: Closed Circuit Television, CCTV surveillance, CCTV operators, crime detection and prevention

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CHAPTER ONE

INTRODUCTION AND BACKGROUND OF THE STUDY

1.1 Introduction

The use of Closed-Circuit Television (CCTV) systems has grown globally. Highways, shopping malls, offices, public transportation networks, and private residences are all common locations for CCTV surveillance cameras. The utilisation of closed-circuit television surveillance holds potential as a valuable tool in enhancing public safety and security. It serves the objective of safeguarding individuals and assets, as well as facilitating crime investigation. Moreover, it can serve as a valuable source of evidence in criminal proceedings. The proliferation of surveillance systems has led to criminological investigations into the application and efficacy of these surveillance methods.

The presence of security hazards underscores the need for human perception and prompt response. For instance, the arrest and prosecution of individuals who participated in the storming of the United States Capitol were facilitated by the utilisation of surveillance systems that had been established within the premises (Harwell & Timberg, 2021). In April 2013, the identification of two suspects in the Boston Marathon bombing was accomplished by detectives through the examination of video footage obtained from the City's surveillance cameras. According to Clark (2013), the apprehension of the Boston bombers was expedited through the utilisation of surveillance camera footage. The well-known instances of gender-based violence involving Karabo Mokoena were characterised by the presence of closed-circuit television (CCTV) recordings within the perpetrator's residence, which captured the victim's presence in the apartment and subsequent absence thereafter. The evidentiary material played an important role in obtaining the guilty verdict of the perpetrator, as the court duly admitted the recorded footage as a component of the prosecution's case. There exist several instances, both at the local and global levels, wherein closed-circuit television recordings are employed as evidentiary material in court proceedings (Times Live, 2018).

The growth of research on CCTV surveillance notwithstanding, limited knowledge exists regarding the role and work routines of CCTV operators in charge of such surveillance and the routine challenges they encounter in the utilisation of CCTV surveillance systems. This minor dissertation set out to fill this gap by investigating the role played by CCTV operators in their

work space using three CCTV operations centres in the City of Cape Town (under the Metro police department) as a case study.

Closed-circuit television systems possess the capacity to proficiently observe and trace the actions of humans. These systems possess the capacity to integrate invasive technologies, such as facial recognition, that empower a computer to capture and recognise an individual by analysing their facial characteristics derived from a photograph stored in a facial database, commonly known as smart closed-circuit television (Duncan, 2018). In specific countries such as the United States of America and the United Kingdom, initiatives of this kind have faced opposition due to their encroachment on the fundamental entitlement to privacy. In a similar vein, the Republic of South Africa has witnessed a notable surge in the implementation of closed-circuit television systems, a development that has elicited apprehension among researchers and specialists specialising in the domain of public safety. The regulation of CCTV usage in South Africa is lacking, as there exists no established code of practice to govern its monitoring activities (Basimanyane & Dumisani, 2019). The installation of CCTV systems has occurred in the absence of explicit rules to effectively reconcile the competing interests of public and security concerns with the fundamental rights to privacy and adherence to legislative guides such as Protection of Personal Information Act (POPI ACT) of 2013 (RSA, 2013). One potential concern associated with surveillance systems pertains to the potential for authoritarian regimes to exploit the data gathered on individuals' movements, political engagements, and affiliations.

The use of closed-circuit television monitoring systems in public spaces is progressingrapidly, with local authorities often justifying these installations based on their crime mitigation methods. In a concise manner, the underlying justification for the implementation of closed-circuit television (CCTV) is based on the premise that individuals who possess rational decision-making abilities, while being cognisant of the presence of surveillance technologies and the potential consequences of being apprehended and legally pursued, will exhibit a propensity to abstain from engaging in criminal activities or any other forms of misconduct (Lyon, 2011). Nevertheless, the efficacy of closed-circuit television cameras remainsa topic of ongoing discussion. According to Duncan (2018), the assessment of the influence of surveillance on crime is challenging due to the absence of independent research, which hinders the ability to draw definitive conclusions.

Closed-circuit television systems serves as a means by which local governments actively endorse and prioritize the enhancement of public safety, thereby generating substantial evidentiary support. The deployment of closed-circuit television (CCTV) cameras offers several discernible benefits, notably enhanced responsiveness to accidents and congestion, with the provision of precise and current road and traffic data for media outlets and traffic management agencies. The City of Cape Town has invested considerable resources in the establishment of CCTV surveillance infrastructure. The current allocation budget for the expansion of CCTV cameras roll-out to five more areas was contained in the draft budget for the new financial year, sitting at R50 million (Ntseku, 2022).

The examination of the impact and interactions between closed-circuit television operators and cameras remains an area that has not yet been thoroughly explored by scholars in South Africa. The operational, monitoring, and control procedures employed by human agents in the daily management of cameras play a pivotal role in assessing the overall efficacy, long-term sustainability, and utility of technical surveillance systems (Smith, 2004). Hence, this research study aims to investigate the role and issues faced by closed-circuit television operators within their work environment, specifically in relation to their contribution towards effective crime prevention.

1.2 Background to the study

The widespread implementation of closed-circuit television surveillance systems for the purposes of crime detection and prevention has experienced substantial growth on a global scale. CCTV surveillance cameras are commonly utilized in diverse environments, including highways, shopping centres, corporate establishments, public transportation networks, and private premises. The application of surveillance exhibits promises as a beneficial instrument in advancing public safety, augmenting security protocols, protecting individuals and precious resources, and facilitating the examination of illicit behaviors. Additionally, it possesses the capacity to function as a significant reservoir of substantiation in legal procedures pertaining to criminal activities.

Given the limited allocation of policing resources within the purview of municipal authorities and the ongoing prevalence of criminal activities in urban and township areas, it is not unexpected that closed-circuit television cameras have become a desirable tool for deterring crime. The City of Cape Town affirms its dedication to a comprehensive crime prevention strategy that includes enhancing safety and security measures through the utilisation of technological advancements, such as closed-circuit television (CCTV) cameras and drones.

1.3 Research problem statement

We often hear and read in media publications and court hearings how public CCTV systems were used as part of electronic evidence for successful prosecution; however, it neglects the role of the individual who was able to capture and monitor the incident of the suspect in question. Not much is known about the role and function played by CCTV operators in contributing to efficient crime prevention. The CCTV control room depends on human-computer interaction for collecting information about incidences and for improving response to such incidences. This research investigates the perceptions and experiences of a sample of CCTV operators drawn from three control centres in Cape Town. This research has the capacity to enhance our comprehension of the function fulfilled by CCTV operators in crime prevention and reduction endeavours.

1.4 The significance of the study

This study aims to provide insights into the contribution of CCTV operators in crime prevention efforts and facilitate the establishment of industry-wide guidelines for the effective formulation, implementation, assessment, and incorporation of policies pertaining to the utilisation of CCTV in crime prevention. Additionally, it will ascertain the operational difficulties that participants encounter. The researcher embarked on this research endeavor under the premise that those involved in the implementation and management of CCTV surveillance systems, including practitioners, scholars, policymakers, and municipalities, would greatly benefit from a comprehensive comprehension of the strategies implemented to deter criminal activities and the utilisation of CCTV as a situational crime prevention approach.

The study undertook an extensive review of relevant research literature and embarked on qualitative field research that involved interviews with 15 CCTV operators, the Senior Manager of

City of Cape Town Metro police video surveillance and security, and one public safety specialist.

1.5 Research Question

The following questions for study were developed:

- What is the role of CCTV systems operators in contributing to efficient crime prevention through their monitoring of CCTV cameras?
- How best can CCTV systems be utilised as surveillance techniques to prevent and control crime?
- What are the challenges related to everyday CCTV control room operations?

1.6 The research aims and objectives

The present investigations aims to provide a clear sense of what can be reliably considered to be the role of the CCTV surveillance operators in charge of CCTV surveillance mechanisms.

The study's main aim then is to examine the contribution, role, and function of CCTV operators in the discharge of CCTV systems as a crime-prevention technique to propose/suggest better practices for safer communities and city centres through recommendations. Furthermore, it explores work-related challenges that might hinder the intentions and operations of CCTV surveillance systems.

1.7 Chapter outline

Chapter 1: Introduction

This chapter orientated the reader to the study by providing a background to the study and by outlining the overall research problem and the research questions to be explored.

Chapter 2: Literature review

This chapter reviews existing literature on CCTV cameras of relevance to this study. In addition, the chapter considers theoretical ideas of relevance to the use of CCTV cameras as a crime prevention tool.

Chapter 3: Research methodology

This chapter speaks to the qualitative nature of the research enquiry and outlines the research methods utilised, the techniques used for data collection and analytical strategies for data analysis. This chapter further discusses the study limitations and ethical considerations of the study.

Chapter 4: Discussion and interpretation of findings

This chapter presents key research findings organised under five thematic headings. These are the role of a CCTV operator, occupational challenges, inter-collaborations of CCTV operators and SAPS, experience, and views of surveillance systems as a crime prevention strategy from operators and recommendations for improving the surveillance systems practise.

Chapter 5: Conclusion and recommendations

Chapter five brings the discussion to a reflective conclusion and offers and provides recommendations to improve the current CCTV systems in the City of Cape Town.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

As previously mentioned, there is a limited body of literature concerning the responsibilities and functions of closed-circuit television operators inside their control environments. The interaction between humans and surveillance technology in control rooms is a significant factor to consider. The efficacy of cameras, particularly in terms of proactive surveillance, is directly impacted by the actions of CCTV operators (Donald et al., 2015). The surveillance control room functions as a social environment in which the actions and behaviours of operators play a crucial role in the monitoring and interpretation of incidents (Heebls & Aalst, 2020).

The use of video surveillance or closed-circuit television (CCTV) has advanced dramatically over the last few decades to prevent crime and promote safety and security in public and private spaces. CCTV cameras are being used for a wide range of security goals. These surveillance systems can gather datasets, or "big data," which can be analysed using computer algorithms for the processing of data to establish patterns (Duncan, 2018). However, what is lacking is an understanding of the role played by CCTV operators in contributing to efficient crime prevention. CCTV technology as a method of situational crime prevention and policing must be designed, deployed, and operated by humans to support specific security goals. Knowledge about human operators who work with CCTV cameras can advance the attainment of safety and security goals (Keval & Sasse, 2008).

Historically, there was a paucity of research on the utilisation of Closed-Circuit Television (CCTV). The current situation differs from the previous state. There has been a substantial increase in the quantity of CCTV evaluations. Moreover, it is worth noting that previous evaluations of public surveillance research have been criticised for its methodological rigor, with over 55% of studies lacking a comparable experimental-control area design. However, recent studies focusing on Closed-Circuit Television (CCTV) have made significant strides in adopting more rigorous research designs (Piza, Welsh & Farrington, 2019).

Over the past decade, numerous cities around the United States have made substantial investments in closed-circuit television (CCTV) systems. According to recent data, it has been observed that approximately 49% of local police departments in the United States report

employing closed-circuit television cameras. However, this percentage significantly rises to 87% for law enforcement agencies that operate in jurisdictions with populations over 250,000 individuals (Piza et al., 2019:1). CCTV is currently seen by researchers as a "commonplace commodity" that has assimilated into the fabric of our everyday existence.

Following the September 11th terrorist events, there was a discernible growth in the market for video surveillance cameras. In response to the unprecedented assault on American territory, a wide spectrum of persons, including business proprietors and chief executive officers of multinational corporations, expeditiously instituted augmented security measures. Moreover, policing through the use of technology has become instrumental in advancing safety and security by both state and nonstate policing structures. The use of smart policing is often perceived as a potential solution to address the deficiencies inside a malfunctioning police system. This is due to their potential ability to make informed decisions grounded on evidence rather than relying solely on perception and intuition (Stone, 2022). The market for security and surveillance technologies has expanded globally, which has resulted in the addition of new systems and increased workloads for CCTV operators.

In pursuit of an answer to the research question, this literature review focuses on international and South African literature on the use of CCTV cameras to explore the role CCTV operators play in the control room and to consider how that role contributes to efficient crime prevention.

2.2 The watchers (CCTV operators) in surveillance environments

Closed-circuit television operators work in a control room, monitoring and observing suspicious behaviour in a public space using various TV screens. These are linked with surveillance cameras installed in public and private spaces to provide live feeds. The main aim of the installation of these surveillance systems is to detect and reduce crime and to keep the public safe. CCTV operators are required to control and monitor these cameras for various occurrences and incidents. Such systems consist of several cameras, monitoring systems, recording systems, and control room activities (Donald, Donald & Thatcher, 2012).

The number of cameras being monitored concurrently is likely to have an impact on the visual scanning patterns and search strategies employed both within individual cameras and across multiple cameras. For instance, operators may opt to distribute their attention across two cameras when they select only two to focus on (Donald, 2018). This observation implies that events occurring within a brief timeframe are more prone to detection compared to those that

transpire over extended durations, as the focus of attention may be divided among multiple cameras during the latter instances. Operators may opt to focus their attention on a particular visual stimulus depending on many criteria, such as the level of activity depicted, historical incidents that have occurred in the corresponding location, or an image capturing suspicious behaviour that has been recognized and is under surveillance. The operator's capacity to monitor several cameras concurrently is contingent upon various control room factors, extending beyond the cameras themselves. The operators' concurrent monitoring capability is influenced by the information load and the significance associated with the jobs (Stainer, Brown, & Tatler, 2017).

The responsibility of monitoring and detection should be reinforced by incorporating it into the work responsibilities of operators, while also considering the need to prevent a decline in attentiveness over time. Donald (2001) asserts that operator attentiveness can be influenced by various factors, such as the duration of the shift, the frequency and duration of break periods, interruptions, and the requirement for time-sensitive reactions. Furthermore, according to Donald (2001), a significant number of organisations have already implemented rest breaks and job rotation. The potential decrease in detection rates may be attributed to the presence of supplementary responsibilities and disturbances that divert attention away from visual presentations. In order to maintain a balanced approach, it is necessary to consider the potential drawbacks of task variation. The consideration of the psychological burden experienced by operators is also warranted. This assertion is substantiated by the acknowledgment that tasks involving alertness necessitate significant cognitive exertion and induce stress (Temple, Warm, Dember, Jones, LaGrange & Matthews, 2000).

According to Donald (2010), the administration, policy, and allocation of resources for CCTV systems have an impact on the performance of operators. According to Wells, Allard, and Wilson (2006), the influence of passive, reactive, or mixed monitoring on control room staffing is a significant factor to consider. The workplace can be influenced by various factors, including the company's responsibility, financial practices, handling of complaints, access to recordings, sharing of data with other parties, storage of video durations, and adherence to ethical values. The selection, training, and development of operators are influenced by human resource policy (Donald, 2001, 2004; Gill & Spriggs, 2005). The performance of the control room is contingent upon various factors, one of which is the monitoring culture encompassing team composition and allocation of tasks (Pascual, Mills, and Henderson ,2001).

Low wages and low occupational status are both common features associated with CCTV operators as professionals. According to Smith (2004), in his empirical study of CCTV operators in MidTown College in the United Kingdom, it was found that operators lacked job motivation and were poorly paid. Additionally, it was also found that the opportunities for job flexibility or professional progression were limited. Surveillance operators felt unappreciated and undervalued (Singh, 2009). Similarly, Helten & Fisher (2004), in a study of surveillance systems in Berlin Mall, found that operators felt that their work was valuable and yet their salaries were low. Additionally, operators felt that watching screens is not regarded as real work or proper employment by others. These elements might negatively impact motivation and the willingness of skilled operators to remain as CCTV operators. Low morale and lack of staff appraisal are, according to the above-mentioned authors, common features of surveillance control rooms. The above-mentioned authors did not explore the causes and implications of poor morale and lack of appraisal of CCTV operators, which are regarded as critical aspects ofany professional setting.

Smith (2004) asserts that the existing body of research on surveillance systems indicates that cameras are generally controlled and monitored with a high level of effectiveness. Nonetheless, it is important to note that this is not universally true in all instances. Moreover, operators in certain control room centres allocate a portion of their time to other work-related tasks that do not entail observation and monitoring. According to Security Park (2001), as referenced in Donald (2010), it has been argued that the attention of operators tends to wane after a period of 15 minutes, leading to diminished concentration throughout the duration of their shift. Furthermore, it is possible for operators to experience exhaustion, boredom, and/or a lack of appreciation. Within a control room setting, it has been seen that surveillance operators engage in activities such as playing phone games, reading newspapers, engaging in conversations unrelated to work with fellow operators, and taking prolonged breaks while on duty (Smith, 2004; Gill et al., 2005, as cited by Donald, 2010). Due to the prevalence of informal activities, there is a lack of constant monitoring and observation of cameras, leading to inadequate detection capabilities in situations where proactive monitoring is necessary.

CCTV operators monitor a significant number of cameras, with some CCTV operators selecting certain cameras to focus on and end up paying moderate attention to the multiple cameras in their workstations (Stainer et al., 2013; Stark et al., 2015). The choice regarding which camerato monitor is thus key and is normally influenced by ideas about where anti-social behavior

is most likely to happen. Notably, there is considerable room for errors in monitoring several cameras at any particular time (Stainer et al., 2013).

2.3 Training Needs of a CCTV Operator

Drawing on literature in the United Kingdom, most operators are required to be formally trained by accredited training centres. In some cases, operators receive internal training. Security companies are likely to employ CCTV operators with previous work experience in the security environment, specifically CCTV operations experience. Some security companies provide on-site training to recruits, while others do not provide such training. Operators are trained in new technical devices for the control and running of CCTV surveillance systems. The exact role of a CCTV operator is determined by individual organisations. However, it is imperative for security companies to provide detailed training needs that cover key aspects of CCTV control room dynamics (Centre for the protection of National Infrastructure, 2017). CCTV operators undergo an induction process that encompasses various aspects of their employment, including familiarisation with the CCTV team, the broader organisational context, the operation of all equipment within the CCTV room, as well as acquiring detailed knowledge of camera placements and the specific site(s) to be monitored. In practical terms, this entails physically inspecting the designated area, sometimes referred to as "walking the plot," whenever feasible. This includes making visits to sites that are monitored remotely. Furthermore, operators are trained to be knowledgeable about the prevailing kind and severity of security threats present within the facilities.

Furthermore, the study offers comprehensive understanding of camera perspectives and the camera indexing system. An essential aspect of the job entails comprehending the significance of pertinent external teams, agencies, and/or networks. Training programmes also aim to equip operators with the necessary skills and knowledge to effectively respond to emergencies. This is commonly accomplished through the utilisation of incident simulation scenarios, which strive to replicate the conditions of actual emergency situations (Centre for the Protection of National Infrastructure, 2017).

In the United Kingdom, closed-circuit television (CCTV) operators undergo continuous professional development through the utilisation of personalised training standards. The implementation of CCTV training criteria and the development of comprehensive learning strategies yield numerous advantages for operators. According to Diffley and Wallace (1998),

this approach has the potential to effectively meet the requirements of the work environment and motivate individuals to assume responsibility for their own growth, so enhancing their feelings of achievement and job contentment. In addition, operators are provided with refresher courses to augment their skills and stay abreast of advancements in the systems.

In the South African context of CCTV operations and surveillance, there is no equivalent body of research on the training of operators. It would appear that training is not standardised. Different requirements are applied by different security companies. There is also no agreed code of practise regarding training currently in existence.

2.4 Surveillance operators practice

Certain processes and techniques are deployed in the CCTV control room system. CCTV operators use certain attention sets. Situational awareness facilitates better monitoring, allowing the operator to direct their attention to places and objects that are more likely to provide pertinent information. Additionally, it has been demonstrated that a wide variety of cognitive knowledge structures can drive an operator's search through images in a goal-directed way.

Suspiciousness is linked to an operator's cognition. It sways the surveillance operators' search strategies in a goal-oriented manner. Suspiciousness in surveillance is more predictive of eye movements. The principle of suspiciousness has been denounced as it could be guided by biases and stereotypes rather than objective monitoring. As Smith (2012) emphasises, minorities and marginalised individuals are more likely to become victims of excessive monitoring (Donald, 2019). CCTV operators decide on who and what to watch, and how they perceive suspiciousness depends on aspects such as the industry, control room culture and norms, operator bias, training, and experience.

Two types of surveillance are conducted in the CCTV control room. Both reactive and proactive surveillance are important functions in a control room. Both are likely to place cognitive demands on operators. Reactive surveillance entails watching previously captured films to analyse events after they have occurred and watching cameras in response to alarms (Donald, 2018). It is also referred to as passive surveillance. According to Slogan (2019), passive surveillance systems are most helpful for creating forensic images, which can be utilised afterwards to identify potential perpetrators and offence specifics when an occurrence is reported by the victim or otherwise becomes public knowledge.

Real-time proactive surveillance frequently takes place in the absence of system-generated cues that notify operators of potentially important events. With proactive surveillance, there is a need for constant monitoring of CCTV cameras for real-time capturing and reaction. It is much more expensive to actively monitor screens to deploy a quick law enforcement response than it is to passively collect potentially helpful images during the many hours of inaction (Skogan, 2019). As more operators are needed for each camera, proactive monitoring is more expensive compared to reactive surveillance.

The detection of potential incidents and the upkeep of public safety and security are heavily dependent on CCTV operators. However, studies reveal that their performance can be poor due to control room surveillance challenges (Gill et al., 2005; Webster, 2009; Keval & Sasse, 2009). There exists a substantial body of research supporting the assertion that CCTV cameras pose technical and social constraints. Keval and Sasse (2010), Luff et al. (2000), and McCarthy et al. (1997) conducted empirical research and identified a plethora of technical challenges and social problems hindering the effectiveness of surveillance and impacting the cognitive vigilance of the operator. Whilst CCTV cameras can be used for crime prevention, surveillance systems are, however, prone to technical and social constraints. Such constraints reduce operator performance and effectiveness of the systems (Keval & Sasse, 2010). Furthermore, elements that decrease the efficiency of CCTV have an impact on other CCTV stakeholders' ability to communicate and respond to incidents as well as the operator's performance.

Given the significance of goal-directed attention deployment, surveillance operators must have a better grasp of the environment under surveillance (Donald, 2018). Other surveillance operators are mandated to know and identify individuals regardless of disguises and degraded visuals. Commonly, CCTV operators are unlikely to recognise faces on cameras. The dilemma in recognising individuals on cameras is perpetuated by the fact that targets must be shown from different cameras, and often, they move from the view of one camera to another, which is in a different direction (Davis & Valentine, 2008). Such movement creates completely different viewing conditions, for example, different lighting, angles and amounts of obstruction (Layne, Hospaldales & Gong, 2012).

CCTV operators work with state of the art of surveillance equipment and possess the required mental models of various incidents that could take place; however, detection is often very challenging. Additionally, it is not all the case where CCTV operators would be furnished with high-powered technology and immediately adapt to the application of such technologies. There

are various reasons for the difficulties they face. How operators' job descriptions are formulated may thwart them from looking at surveillance systems for periods. Some operators are required to shift their attention from monitoring to other operations-related activities, such as report writing and contacting emergency services (Donald, 2018). Moreover, operators may adopt a passive surveillance approach involving little attention given to visual analysis and articulation of the images appearing on cameras. Helten and Fisher (2004), argue that in certain situations, operators were found to be spending less time on online monitoring. Divided attention, which includes multitasking, is applicable in certain instances, and this means that the attention of the operators is directed away from active monitoring of cameras, which may cause errors (Minortra & Mcneese, 2017).

In order to effectively interpret the events captured by CCTV, operators are required to establish a collective consensus or shared comprehension on the significance of these unfolding occurrences. This agreement is crucial for determining a coherent understanding of the observed footage and then deciding on appropriate courses of action. In order to comprehend the seen images and articulate claims to be relayed to the police via radio communication, it is necessary to engage in direct interpersonal interaction with other operators (Heebels & Aalst, 2020). The opinion of Heebels and Aalst (2020), is supported by Luff and Heath (1992), who argue that CCTV operators' collaboration in a surveillance environment is essential. This collaboration may consist of other actors outside of the control room, such as the police, municipal peace officers, and public and private investigators. CCTV operators in control rooms and other coordination centres integrate their various ideas on what is going on through connected action and communication in monitoring and controlling social behavior.

2.5 The principle of vigilance in surveillance control rooms

Vigilance is regarded as a code of practise of CCTV operators. According to Donald & Donald (2001), vigilance is the capability for prolonged effective attention when keeping an eye on a situation to which the observer must react. Numerous social, organisational, technical, and environmental factors interact to influence the operators' level of vigilance and, in turn, their ability to recognize threats. Thus, maintaining vigilance is essential for effective CCTV surveillance operators, who must pay close attention for extended periods to spot incidental situations.

The design of CCTV operations rooms is mostly proactive as opposed to passive surveillance. It necessitates active observation, ongoing images and information analysis, context-setting, and continuous assessment of the state of the scenario (Donald, 1999). Thus, the operator must be able to maintain constant vigilance. Moreover, continuous concentration and the capacity to spot incidence are crucial even in situations that may involve times of more intense focus or pressure. The outcomes depend on the processing and identification of perception. This goes beyond mere sensory recognition to include awareness of the situation's context and the detection of patterns in the information being exhibited. Donald (1999) further argues that the principle of vigilance further requires that the operator must have the capacity to manage several sources of information and flexibly allocate attention based on the pattern or importance of signals received.

The effective monitoring of surveillance systems necessitates the consistent application of sustained attention coupled with astute situational analysis. According to Parasuraman (1984), operators contribute varying levels of overall alertness to the task, with some operators exhibiting higher levels than others. In certain cases, operators experience a decline in sustained attention towards cameras as a result of a reduced ability to identify incidents. This decline is commonly known as "vigilance decrement." Koelega (1996) argues that vigilance decrement happens as performance declines over time. It can be the result of a variety of factors related to the control room, such as fatigue, dull moments, and poor attention. Moreover, decrement in vigilance in some instances is not necessarily a function of a reduction in mental capacity or energy over time. It can be a deliberate move on the part of operators to save resources for more advantageous usage (Hopstaken et al., 2016). In the control room set-up, levels of mental fatigue may fluctuate due to routine activities associated with the monitoring of cameras. Additionally, this may coexist with other disease-associated disorders such as Parkinson's disease (Chaudhuri & Behan, 2004), depression (Demyttenaere, De Fruyt, & Stahl, 2005), and burnout (Maslach, Schaufeli, & Leiter, 2001)

In adherence to established protocols, operators are mandated to maintain constant vigilance during monitoring activities. However, due to extended shifts, fatigue, and the need to oversee multiple cameras, it is improbable that operators will not encounter a decline in alertness at

some junctures when operating the cameras. Resource depletion is identified as a significant contributing cause to the decline in alertness. According to the resource depletion explanation, it is anticipated that as the duration of a task increases, the availability of attention diminishes progressively and cannot be consistently refilled. Consequently, engaging in activities that need sustained attentiveness becomes more difficult to accomplish. The availability of attentional resources steadily diminishes, resulting in a decline in alertness (Grier et al., 2003; Warm et al., 2008). Vigilance theories ascribe the decline in alertness to a range of cognitive and motivational reasons, many of which are integral to the cultural implementation of surveillance systems (Donald, 2018). Moreover, vigilance performance can be influenced by various aspects like motivation, mood, morale, health, substance use and smoking, work/rest schedules, circadian rhythms, and search strategies (Mackie, 1987).

2.6 The dull factor in surveillance control systems

According to Smith (2004), the main cause of boredom is the tedious viewing of routine television visuals, and this contributes to boredom among surveillance operators. Operators tend to spend long hours on screens without necessarily capturing any incidents. In certain control centres, operators are required to capture a minimum of two incidences to meet a weekly target of detecting incidences.

According to Smith (2004), CCTV monitoring is a procedure that demands prolonged, concentrated, as well as selective attention. For Warmer, Parasuraman, and Mathews (2008), sustained focus or attention on monitoring activities creates considerable demands on operators' mental workload. In surveillance, the number of cameras, the nature and extent of images displayed, and the duration of each shift are inclined to increase mental workload and fatigue (Donald, 2010; Schreibers, Landman & Pinkaar, 2012). According to Donald (2015), in his research on proactive surveillance, half of the sample of operators disengaged within 30 minutes of monitoring, whilst only a third managed to observe cameras for the entire 90 minutes.

In a study at Midtown College, Smith (2004) found that operators had various ways of alleviating boredom, including wasting time. Strategies to deal with the tedious routine of the control room included having long conversations with colleagues, taking frequent smoke breaks, going to the bathroom and/or making many cups of coffee or tea. During such breaks, controls were left unattended.

2.7 Selective monitoring by CCTV operators

According to Norris and Armstrong (1999), what operators monitor and define "suspicious" varies across surveillance sites. The variance is a function of control room culture and norms, operator training, and work experience as biases. According to the authors, surveillance operators create a set of working principles to separate suspicious from non-suspicious actions. Such operating principles, which are based on institutional policies and operators' beliefs, result in selective targeting of those observed. Such selective targeting is influenced by age, race/ ethnicity, gender, and perceived social class. For Welby (2005), racially biased surveillance is a product of both the operators' subjectivity and the policies and principles of the organisation for which they work. However, for Neyland (2004), cited in Heebels and Aalst (2020), the decision to watch or follow someone is not made by operators based on pre-established guidelines. Operators, on the other hand, perform what they believe they are observing to generate an impression of what is deviant.

According to Katherine and Johnstone (2000), CCTV operators categorise people and their behaviours with respect to both time and location using their own normative concepts. Operators identify particular people and behaviours as undesirable and then go on to justify surveillance. This implies that individuals who are chosen by the operators for extended surveillance are individuals considered to be physically out of place and time. Norris and Armstrong (1999) and Smith (2004) argue that CCTV operators must make challenging judgement calls when separating acceptable behaviour and appearance from those that are deemed 'abnormal' and potentially harmful. In a study of the control room in MidTown College in the UK, Smith (2004) also found that in the control room, certain sociocultural constructs of deviance were being employed, giving the impression that certain clothing requirements were fundamentally deviant to the operators. Indeed, it seemed that CCTV operators in the control room shared the opinion that anyone wearing anything that even slightly obscured their identity was purposefully up to "no good". Additionally, some CCTV operators appeared to connect specific fashion accessories with subcultures linked to crime and deviance. Based on the assertions made by Smith (2004), it is fair to conclude that operators at some point apply selective surveillance to predict anti-social behaviour.

2.8 The technical layout of CCTV control room systems

Surveillance systems operators work in an environment which influences the effectiveness of detecting live criminal behaviour (Donald, 2018). Surveillance systems vary considerably regarding their design and effectiveness. Moreover, it is worth noting that the technical capabilities of these systems have transformed over the years. The effectiveness of detecting significant events and showing individuals is related to how these systems are designed to fit the purpose (Donald, 2018). The capabilities of surveillance systems are influenced by placement, resolution, lighting, field of view and detection of small details and quality of the image. However, some of these factors remain challenging for operators and the effectiveness of surveillance systems (Pikaar, 2015).

Some studies capture resistance amongst operators to make use of (some) technology. A research study conducted in 2011 by Li, McKee, Horberry and Powell (2011) reveals that the existing control room setting has several significant flaws in the way people and technology are integrated. In their study, operators were not willing to use alarms and other devices. Operators felt that some technologies were too complex for operators. In addition, other research studies on CCTV control rooms, such as Luff et al. (2000), also confirmed the challenges faced by operators in using technology in a control room set-up. Kaval and Sasse (2008) found that the application of technology was hampered by the lack of system integration. Regarding the image quality produced by CCTV systems, the number of operational cameras monitored concurrently is an important factor in a surveillance environment. Various control rooms are still relying on a high ratio of cameras for operators to monitor, even though research has found that effective monitoring declines as the number of cameras increases (Tickner & Poulton, 1973).

CCTV surveillance systems that rely on direct human performance are directly impacted by system design (Adams, Tenney & Pew, 1991). Considerations for CCTV system design include the number of cameras and displays per operator, number of cameras per operator, views per screen, camera angles, and image brightness (Neil, Thomas & Baker, 2007). In addition, the technical set-up of the surveillance system should further include compression and resolution of effects of the CCTV cameras, digital and analogues, colour versus monochrome surveillance and method of transmitting data (Donald, 2008). The physical surveillance workplace is a

crucial component of system design. Performance may be affected by noise, temperature, distractions, interruptions, and physical mobility (Donald, 2010).

In most monitoring CCTV control rooms, temperature and noise levels can be regulated, yet noise may exist to different degrees and distract operators. Smith (2004) warns that as operators of CCTV systems are usually confined to control rooms, this can cause a sense of imprisonment and restlessness. A sense of "imprisonment" may cause alienation for CCTV operators and have a negative impact on their motivation.

2.9 Theoretical and conceptual framework

Two environmental criminological approaches have been used to explain how CCTV can, theoretically, reduce crime, namely Routine Activity Theory and Crime Prevention Through Environmental Design (CPTED).

2.9.1 Routine Activity Theory

Routine activity theory was developed by Cohen and Felson (1979) and later refined by Felson. Routine activity theory is a key theoretical approach in the field of criminology. The theory states that crime occurs when three elements converge, namely, a situational target, the absence of a capable guardian, and a likely motivated offender (Cohen & Felson, 1979). Routine activity theory suggests that if all three elements are present at a given time and situation, then there is a high chance that a criminal act may occur.

From a routine activity theory perspective, it is suggested that CCTV cameras operated from the control room act as a capable guardian and will act as a crime deterrent. The anti-social behaviour in public and private spaces. CCTV cameras will discourage criminal behaviour if there is constant monitoring and effective evaluation of CCTV cameras from the control room by CCTV operators (Cohen & Felson, 1979).

2.9.2 Crime Prevention through Environmental Design (CPTED)

The theory of crime prevention through environmental design (CPTED) is a pertinent framework that can be applied to the present investigation of closed-circuit television (CCTV) monitoring. The theory posits that the implementation of specific environmental measures might effectively mitigate crime rates. One of the fundamental principles of the theory is the utilization of surveillance systems, such as closed-circuit television (CCTV). The following

principles are based on (CPTED) territoriality, surveillance (informal and formal), access control, image/maintenance, activity support and target hardening (Couzens, Greg & David, 2005). Territoriality is a design principle aimed at enhancing a “feeling of ownership” in lawful space users, therefore decreasing the potential for the offence by discouraging unauthorised users. Surveillance, in terms of this theory, suggests that physical design has the potential to encourage formal/ natural surveillance by keeping offenders under observation by other users of the space or from the surrounding areas.

Access control consists of a design technique that aims to reduce the likelihood of crime by preventing access to the target of the crime and fostering a sense of suspicion of danger for possible criminals (Mississauga, 2013). Active support includes utilising design and signage to promote intended patterns of usage of public space (Couzens et al., 2005). In addition, creating a positive image and regularly maintaining the built environment guarantee that the physical environment continues to operate efficiently and sends out positive signals to all users (Couzens et al., 2005). There has long been recognition of the importance of the physical state and "image" of the built environment, as well as the impact these factors may have on crime and fear of crime. Finally, it is widely acknowledged that target hardening is the predominant approach in crime prevention, as it effectively raises the level of difficulty for potential criminals in executing their illicit activities. The objective of this approach is to impede or restrict the entry of perpetrators to the intended location through the use of various physical deterrents, including but not limited to locks, alarms, closed-circuit television cameras, fences, security patrols, and gates.

The physical design can promote informal and informal surveillance for residents and their agents and surveillance. In addition, surveillance systems are also regarded as a crucial component of capable guardianship. Here, the argument is that offenders are less inclined to offend if they believe they are being watched because they have a better chance of being caught, apprehended, and prosecuted.

2.10 CCTV and crime deterrence

The prevailing perspective supporting the implementation of closed-circuit television (CCTV) in both public and private domains posits that it serves as a means of deterring criminal activity by instilling a sense of vigilance among potential wrongdoers, who are made aware of their constant surveillance and the increased likelihood of apprehension. Closed Circuit Television

(CCTV) fulfils various purposes. One of the primary goals outlined by Welsh and Farrington (2009) is the mitigation of property crime in both public and private domains. From a situational crime prevention approach, closed-circuit television has been theoreticallyjustified as an effective strategy for crime prevention. The objective of this method is to enhance the perception of danger by modifying the physical environment, hence reducing the likelihood of criminal activity. CCTV is classified as a "formal surveillance approach" within the taxonomy of situational crime prevention, as outlined by (Cornish & Clarke, 2003). Consequently, closed-circuit television (CCTV) cameras are perceived as an adjunct to augmenting individual safety.

The deployment of CCTV cameras may contribute to offender arrests and increase natural surveillance (Piza et al., 2019). In addition, the deployment of CCTV may improve the sense of public safety, thus increasing the number of people accessing a particular area because of perceived heightened security features. In addition, CCTV can aid the police after crimes have been committed, particularly by enhancing the response time of authorities to emergencies and providing visual evidence for use in criminal cases (Ratcliffe & Tanigichi, 2006). According to a study conducted by Gill and Hamming (2004), it was discovered that a significant proportion, specifically 25 percent, of street confrontations in Lewisham were initially identified and reported to the police by closed-circuit television (CCTV) operators. This finding highlights the potential of surveillance systems to provide law enforcement with an advantageous position in addressing incidents before they escalate to a level of severe harm (Piza, Caplan & Kennedy, 2017:250).

According to Winge and Knutsson (2003), the deployment of CCTV can increase the reported number of crimes as it can virtually capture offences that would not have been reported to law enforcement. In addition, CCTV cameras could signify improvements in the area by boosting informal social networks, community pride, and community cohesion, which in turn could lead to a reduction in crime prevention. Contrary to popular belief, CCTV could also increase criminality by giving victims a false sense of feeling safe, thus making them vulnerable to crime because they eased up on their vigilance or stopped taking precautions in public areas.

According to Gill and Spriggs (2005), in order for closed-circuit television (CCTV) to effectively contribute to crime prevention, it necessitates proficient management including achievable objectives, sound managerial practices, comprehensive technological comprehension, and adequately qualified CCTV operators. The implementation of closed-circuit television (CCTV) systems holds promise in mitigating and deterring criminal activities. Nevertheless, it is important to acknowledge that CCTV should not be universally perceived as an infallible deterrent against criminal behaviour in both public and private domains. The existing body of literature indicates that its effectiveness is more pronounced in specific categories of offenses and geographical regions. According to the systematic review conducted by Welsh and Farrington (2009), the utilisation of closed-circuit television (CCTV) has demonstrated notable efficacy in deterring certain categories of criminal activities within specified geographical contexts.

The issue surrounding the potential crime-reducing effects of closed-circuit television (CCTV) continues to be a subject of ongoing debate within academic circles, lacking a definitive consensus. Nevertheless, a significant number of individuals persist in purchasing and installing closed-circuit television (CCTV) systems in both public and private areas. Furthermore, the sale of surveillance systems is often accompanied by the notion that they serve as a deterrent to criminal activity, and the utilisation of technology in law enforcement plays a crucial role in combating crime. Consequently, facilitating the widespread adoption and utilisation on a global scale.

2.11 Privacy vs CCTV cameras and CCTV operators

CCTV systems can identify offenders through footage and live records, and CCTV cameras may violate the right to privacy (Giddens, 1985). Interestingly, CCTV proponents argue that privacy issues should be secondary to the safety and security of the citizens. Nevertheless, since the emergence of CCTV cameras globally, there have been concerns raised by human rights activists, researchers, and critics of CCTV cameras. The systems may result in human rights violations, particularly the right to privacy. Concern about the political uses to which surveillance may be put by states has contributed to calls for clear legislative guidelines for users of surveillance. The Snowden revelations of the USA National Security Agency's (2013) global surveillance – which included spying activities – have also shown how internet companies and states can collude to conduct mass surveillance by violating human rights (Duncan, 2018).

Technology in policing has sparked a global debate regarding civil liberties, specifically digital policing using modern CCTV with more advanced technology. Users argue that CCTV cameras promote safety and security and can reduce crime without providing convincing evidence that CCTV cameras decrease crime. Regarding privacy, the argument is that there are no legitimate expectations of privacy in public areas. In the context of surveillance policing in public space, privacy does exist; however, it is not guaranteed that this will be practised by operators and users. Thus, concerns have been raised by public safety policymakers and researchers about how CCTV users will ensure that the civil liberties of civilians are protected against unethical practices by operators.

2.12 City of Cape Town CCTV cameras footprint as a case study

The allocation of substantial resources by the City of Cape Town has been dedicated to the implementation of closed-circuit television (CCTV) camera surveillance. The implementation of closed-circuit television (CCTV) cameras was initiated during the 1990s in Cape Town as part of the city's efforts to secure its candidacy for the 1998 Olympics, which ultimately proved unsuccessful (Minnaar, 2007). The primary objective behind the installation of these cameras was to mitigate crime rates and enhance the safety of tourists visiting the city. The City of Cape Town Council was entrusted with the implementation of a planned Closed-Circuit Television (CCTV) system for the Olympics. This decision was made to enhance safety and security in the city while also considering the cost-effective of the crime reduction and prevention approach. The security strategy was approved by the council.

The implementation of Cape Town's public closed-circuit television (CCTV) surveillance system took place in December 1998, wherein a pilot phase was initiated with the installation of 12 CCTV cameras in the central business district (CBD). According to Minnaar (2007), the city had installed approximately 75 closed-circuit television (CCTV) cameras by December 1999, thereby providing surveillance coverage for a significant portion of the central business district (CBD). In parallel, throughout the middle of 1999, other cities throughout the nation began implementing pilot programs to test the efficacy of closed-circuit television (CCTV) camera systems. Nevertheless, the efficacy of these systems' implementation seems to be comparatively lower in contrast to Cape Town, where the installation of CCTV cameras resulted in significant apprehensions in various areas. Accordingly, according to Minnaar (2007), the Cape Town CCTV model emerged as a fundamental component of the city's strategic safety and security initiatives.

In the year 2000/1, the City Council granted additional funding to support the expansion of closed-circuit television (CCTV) cameras, with the aim of extending coverage to encompass various regions within the metropolitan areas. Furthermore, this collaboration entailed a joint effort by the municipal authorities and local businesses. According to Minnaar (2007), the City of Cape Town possessed a total of 166 closed-circuit television (CCTV) cameras throughout the urban area in the year 2004. The implementation strategy additionally involved the participation of the Cape Town Traffic Department, Metro Police, and Unicity law enforcement. This was accompanied by the allocation of 340 municipal police officers to provide support of the roll-out campaign. By the year 2005, the City of Cape had undertaken a modernisation initiative for its closed-circuit television (CCTV) cameras project. This involved the installation of additional cameras equipped with advanced technology that utilised digital signals, as opposed to the prior camera systems. This was established with the Strategic Surveillance Unit, a division accountable for safety and security through surveillance within the Metro Police Department (Minnaar, 2007).

The City of Cape Town has created a comprehensive blueprint for the implementation of an integrated closed-circuit television (CCTV) system under the Metro Police Department. The Master Plan is widely recognised as a dynamic and comprehensive planning document that serves as a guiding framework for the strategic implementation and deployment of closed-circuit television (CCTV) cameras throughout the City of Cape. The implementation of CCTV surveillance in the city provides a definitive framework for its utilisation in the context of crime mitigation and deterrence. The implementation of CCTV applications can be considered as a significant investment, as they entail substantial capital expenses. Moreover, the operational costs connected with the deployment of these systems can often be prohibitively high, especially when a real-time monitoring service is included, along with a 24-hour response capacity. Nevertheless, it is imperative for police agencies to persist in their role of overseeing and addressing criminal activity, as they are bound by legal obligations to carry out policing measures in reaction to such incidents.

By April 2018, the City of Cape Town had 2 2345 CCTV camera systems on its network. This included CCTV cameras under Metro Police, My Citi-IRT, SANRAL, and privately owned CCTV cameras. Moreover, only six per cent of Metro Police Department cameras had facial recognition (Allen & Van Zyle, 2020:15). The Metro Police Department also introduced a CCTV response team to quickly respond to safety security and emergency incidents. In 2018, this unit managed to open and lay charges against twenty-nine suspected criminals within the city (Safer spaces, 2020). The city, under the Metro Police Unit, runs 24-hour CCTV monitoring centres both in Centre 1 and 2.

2.13 Chapter summary

This chapter provided an overview of the cultural practises of CCTV operators in a surveillance environment, which included the technical side of surveillance, and the operational challenges operators have to deal with. The literature further touched on international, African, and South African studies regarding CCTV as a crime prevention tool and included debates surrounding the efficacy and challenges confronted by the systems and their operators. African studies, including South Africa, show that little is known regarding the human factor behind the operation of CCTV cameras in contributing to efficient crime prevention initiatives. The literature has also indicated how the City of Cape Town has reformed its crime-fighting strategies through the large investment of resources into smart policing. The review of the literature aimed to gain a more comprehensive understanding of the research study, including the debates relevant to the nature and impact of CCTV surveillance.

One notable aspect, which is mostly overlooked in the existing body of literature, pertains to the current reliance on human involvement in the operation of closed-circuit television (CCTV) systems. Specifically, the monitoring and control of cameras, as well as the interpretation and response to the generated incidents. The next chapter will provide an overview of the research methodology utilised in this research study with reference to the research design, sampling decisions, data collection techniques and data analysis.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Chapter three provides an overview of the research methods and design utilised in this research study. It is made up of research design, data collection, sampling methods, ethical considerations, unobtrusive observation, study limitation, data analysis strategies, and characteristics of the sample. Moreover, the rationale behind choosing these research methods will be discussed.

The research question of this study aimed at probing and understanding the role and function of CCTV operators in contributing to efficient crime prevention. Socio-technical challenges of the surveillance control rooms were also probed from operators' perspectives. The study at hand takes the form of a case study of the City of Cape Town CCTV control rooms. The city has also invested considerable resources in the use of CCTV surveillance systems for policing purposes.

A research design can be described as a comprehensive strategy that delineates the procedures for conducting observations and executing a research project (Monette, Sullivan & De Jong, 2008).

3.2 Research methods

For this study, a qualitative research method was employed. The qualitative research approach seeksto answer questions that provide a more comprehensive understanding of a social problem froman intensive study of a few people. Moreover, the qualitative research method enables the researcher to understand and create a holistic, rich picture of the participants' world. The qualitative research methodology is characterised by its naturalistic approach since it seeks to investigate individuals' daily experiences inside their authentic environment (De Vos, Strydom, Fouch and Delport, 2011). The utilisation ofthe qualitative paradigm facilitated the acquisition of comprehensive and profound data by the researcher. The research conducted was characterized by an exploratory and descriptive approach, aiming to examine the role, function, and contribution of closed-circuit television (CCTV) operators.

3.3 Research site

The research sites for this research study comprised three CCTV control centres within the City of Cape Town. The CCTV centre in the central city specifically monitors parts of the central business district (CBD) and the surrounding areas. Other CCTV centres are based in two locations of the city, monitoring rural communities on the outskirts of the city. The target population consisted of CCTV operators based in these three CCTV control rooms.

3.4 Sampling procedure and sample size

Sampling refers to the process of selecting a subset of units from a larger population, as described by (De Vos, et al., 2011). Sampling methods can be classified into two main categories: probability sampling and non-probability sampling. Probability sampling is a widely employed technique in quantitative research methodologies, wherein each member of the population has an equal likelihood of being chosen as a sample unit. In the context of qualitative non-probability sampling methods, it is observed that the selection of units from the population does not occur with equal probability (Wiid & Digginess, 2009). One of the main rationales for employing sampling methods in research is the consideration of feasibility, as it is frequently unfeasible to investigate an entire population. The study's sample population comprised 15 CCTV operators who were stationed in the controlrooms of the City of Cape Town. This included Director of City of Cape Town CCTV camerasand surveillance, and a public safety specialist. The selection of participants was based on their level of professional experience inside the CCTV control room setting. Ideally, the inclusion criterion for participants in the sample required a minimum of four to five years of professional work experience. A significant factor to be taken into account in this selection is the potential for experienced closed-circuit television (CCTV) operators to offer valuable insights into their work environment and operational duties. The sample consisted of people of both genders.

The researcher was aiming at representativity along the lines of gender and years of experience, with operating centres overpopulated by male operators except one in Retreat. The sample was balanced, where seven male and female CCTV operators were selected. This decision was informed by the profile of the population of operators. It would not make sense to overpopulate a sample with male operators who account for ten per cent of all CCTV control room centres within the City of Cape Town. The CCTV operators were selected from both dayshift and nightshift from all three CCTV control room centres where data was collected.

According to Mcraavey and Das (2013), researchers are dependent on the input of gatekeepers since they manage access to a given group or institution. The importance of gatekeepers in social research is widely acknowledged (De Laine, 2000), particularly in cases when sensitive topics are included or when the research is carried out among communities that exhibit scepticism towards conventional research methods. (Eide & Allen, 2005; Knight, Bentley, Norton & Dixon, 2004; Yancey, Ortega & Kumanyika, 2006). They possess the jurisdiction to decline the researcher's access and might potentially influence the decisions of participants about their participation or withdrawal from the data collection. On the other hand, the act of denying entry due to one's status as an outsider and the attentiveness towards their surroundings were taken into account. According to De Laine (2000), expediting the recruitment process can be achieved through gatekeepers engaging in direct negotiations with prospective study participants. The presence of gatekeepers played a crucial role in facilitating entry into the research sites and securing the participation of individuals. The process of negotiating access required a significant amount of effort and time. The process of negotiating access to research is a crucial phase in which gatekeepers play a pivotal role by providing assurances and exerting their authority to facilitate the researcher's acquisition of consent and support from potential participants.

The City of Cape Town Director of Metro Police and Surveillance Systems, together with the Securitas Site Manager (Gatekeepers), was first introduced to the research study through an email signed by my supervisor requesting access. According to Clark (2011), the interaction between gatekeepers and researchers is rarely straightforward and easy. Initially, the gatekeepers seemed reluctant to provide access due to security concerns about the environment. However, a meeting was scheduled with both managers where a formal presentation of the research proposal and interview schedule was presented. Once proof of ethical clearance from UCT was provided, the City of Cape Town’s Research Development Unit approved the research request and made an allowance for two months for data collection. Once access was granted after the formal engagement with the gatekeepers, I could begin to build rapport with potential participants. The process of building rapport began on the first day when I was observing CCTV operators in action at the Cape Town control centre. The research proposal and interview schedule were sent to supervisors both Centre 1 and 3 to assist with the selection of relevant participants.

During the application of gaining access to potential participants, we sent an application letter directly to the Department of Metro Police and Surveillance instead of the Department of Policy and Strategy. My supervisor and I decided to restart the process again, which took almost 2-3 months for permission to be granted. A letter had to be sent to the Corporate Department. This office then sent the letter to Policy and Strategy for processing. Before the Policy and Strategy grant permission, it had to send the research request letter to the Quality Assurance Unit for further assessment. Then, Policy and Strategy had to send out a communication with a letter of approval to the Metro Police and Surveillance Unit granting research permission.

Purposive sampling was deployed to assist further in the selection of a sample selection. According to De Vos et., al (2012), purposive sampling involves the deliberate selection of a case that exemplifies specific characteristics relevant to a given study. In the present context, the case pertains to CCTV operators stationed at control room centres located in the City of Cape Town.

3.5 Data collection techniques

Semi-structured interviews were applied as a method of data collection for the study. Semi-structured interview methods provide a level of flexibility and informality for the researcher and participants. The use of in-depth interviews enabled the researcher to delve deeper into the subject matter and obtain clarification on any potential misunderstandings that may have arisen (Grix, 2010). The interviews were complemented by conducting literature assessments of secondary data pertaining to the subject matter being examined. It was imperative to establish a sense of comfort among the interviewees at the commencement of each interview, in order to foster an environment conducive to open and candid dialogue.

The interview schedule was prepared in advance (see Appendix A). The interview schedule had three parts; the first part was about the role and function of CCTV operators. The second part focused on surveillance operators' work experience, and the third part canvassed views relating to CCTV systems and crime detection and prevention. Each interview with participants lasted for about 40-50 minutes to minimise the impact of such interviews on the work responsibilities of the operators. Research participants were sent informed consent forms detailing the procedure and aim of the research study and requesting their voluntary participation. In addition, participants were informed that they had the right to withdraw from participating at any given time without being prejudiced in any way.

Data collection commenced after all relevant parties signed off on the research application. Due to active Covid-19 regulations during the data collection period, all Covid-19 regulations were adhered to during the data collection of each interview held from all three CCTV control rooms. Initially, I requested to conduct interviews using online communication such as Zoom or Microsoft Teams. However, it emerged that none of the participants had access to such online communication platforms, which let me conduct face-to-face interviews. All interviews were conducted in a private and quiet space both in Centre 1 and 2 centre except in Centre 3, where I had to conduct interviews while CCTV operators were on duty. At the start of each interview, I would go through the consent form before the commencement of the interview. This heightened the principle of voluntary participation in thestudy.

The interviews were recorded using audio recording devices, with the explicit consent of the participants. Additionally, field notes were diligently documented in a notebook as a means of collecting data. Furthermore, in conjunction with a conventional voice recorder and a physical notebook, a mobile phone equipped with voice recording capabilities was employed as a supplementary measure to mitigate the risk of potential loss of any of the data gathering tools. Based on the provided information, I documented the observations in order to acquire a deeper understanding of the context. This process involved systematically identifying recurring patterns of information and maintaining a comprehensive record of the events that transpired throughout each observing period. The researchers utilised a digital audio recording program, namely (Otter.I.A), among others, to capture and transcribe a total of 15 interviews. The process of transcribing necessitated substantial editing and repeated listening to the audio in order to enhance the quality of the data. The utilisation of field notes has demonstrated its utility in the process of data cleaning.

The field notes collected captured the moment-by-moment accounts of what happened in each new interview I had with participants. Most participants opted to use English. Out of a sample of 15 participants, only two opted to use their mother tongue (isiXhosa) instead of English for a better understanding and the flow of the interview. These two interviews were translated verbatim into English for data analysis. Participants provided rich and in-depth information regarding their roles and everyday work. Most of this raw data was descriptive. Every word, the interest shown by participants, the answering of questions and the mood of the interview were all recorded. I recorded what I saw, heard, and experienced in detail. Two of the research

sites had a boardroom, which the researcher used as a private space for one-on-one interviews. The third research setting was not equipped with such a space. Two of the interviews had to be conducted while operators were on duty. Gathering information from all three research sites was a thrilling exercise. All participants provided rich data.

Separate interview schedules were created to elicit more information from the City of Cape Town's Director of CCTV surveillance systems. Questions directed to the Director of surveillance systems within the city included costs and maintenance of CCTV and views on CCTV surveillance systems within Cape Town. In addition, a public safety specialist was interviewed to elicit opinions on CCTV as a situational crime prevention initiative with a specific reference to the City of Cape Town for interview questions.

3.6 Surveillance operators in action observation (Cape Town Control Centre)

The intricate nature of closed-circuit television (CCTV) systems can present challenges for individuals attempting to effectively watch and derive significant conclusions. Inexperienced observers, particularly those lacking expertise in security matters, must familiarise themselves with the specialised terminology employed by security professionals while ensuring that their presence does not disrupt normal daily operations. As I entered the CCTV control room, I was met by large screens showing visuals of areas under surveillance within the City of Cape Town, monitoring movements of people entering control rooms and exiting. A shift supervisor was instructed to do a walk-around with me and observe CCTV operators in action without any sort of distraction. At the entrance, I spotted a daily register for all CCTV operators.

I was caught in a technologically interconnected setting where policing is conducted through online systems. With CCTV operators wondering what I was doing in their closed domain coupled with a variety of rapid activities occurring, some CCTV operators gave me a particular look. At those moments, I felt that I was indeed an outsider. It took some time to feel accepted and get to grips with the multiple layers of realities underpinning CCTV monitoring. The standard operating procedure set in place did not allow me to photograph or take a video while I was doing unobtrusive observation. The control room centres are one of the highly secured environments where access is not easily granted. Everyone entering the training centre must scan his/her fingerprint through the fingerprint access control. Similarly, the same access control systems are used in other centres. Only security personnel (CCTV operators) are

permitted into this space, including law enforcement personnel. Access is limited and monitored. There are monitoring cameras from reception up until to the control room. I was accompanied by a shift supervisor who had access to the entrance of the control room, as I did not have any.

Monitoring a myriad of images on various camera screens meant that CCTV operators had a challenging job. None of the operators interacted or spoke to me when I was conducting unobtrusive observation. Given the nature and extent of this type of job, which includes divided attention and a high level of alertness at times, I was able to get a bird's eye view of the operations environment. None-verbal communication among operators was one of the unwritten etiquettes of the control room. On average, 10 CCTV operators worked on a shift. The CCTV control rooms, namely Centre 2,1 and 3, conducted continuous live surveillance for a duration of 24 hours. In addition, all three control centres used and operated digital technology and analogue camera systems, which allowed the control room to access real-time viewing. The control room set-up was designed and filled with technological equipment linked with the job design of operators, such as vigilance performance and detection of incidence. The components of a standard workstation were a desk, a chair, and a monitor.

Operators were typically using keyboards, joysticks, and other control equipment. Typically, their tasks included monitoring, reacting to incidences, communicating with fellow operators, and logging a call to responsible authorities for response. The control room has moderate light because overly bright lighting can cause fatigue, especially at night for CCTV operators. As I was doing my observation, I spotted one big plasma screen with one CCTV operator, and I was informed that he specialises in PC-based geographical maps and databases. In addition, a paper map of the surveillance area covering the City of Cape Town was pasted on a wall at a separate office where the CCTV operator who works with geographical maps was sitting.

The control room is strategically located on a particular floor to avoid noise pollution from outside the building. In my observations, I could spot low and quiet working spaces among operators while they were working. However, there was regular communication among operators. While they can communicate with each other about incidences, they are required to concentrate on multiple task systems at the same time, and concentration means less noise for them. Another observation was that operators were not allowed to use personal cell phones while on duty; however, they were allowed to call law enforcement on the ground to respond to reported incidences using EPIC systems (incident management system). The EPIC system

is mainly utilised by the following entities: law enforcement, Traffic service, Disaster risk management, and Metro police. Any of the above-mentioned units can be reached on EPIC systems for rapid response. Moreover, a logbook is used to report any incident captured on screen. Centre 1 and 2 control rooms were not part of the observation due to time constraints and resources. A police officer was also spotted sharing an office with CCTV operators, asking why a SAPS member is part of the control room centre. The answer was that he was assisting with the escalation of reported incidents to the SAPS members on the ground for a quick response.

3.7 Data analysis

Data analysis is the systematic organisation, arrangement, and interpretation of collected data to derive meaningful insights and establish their relevance.

3.7.1 Data coding

According to Nvivo 12 Pro, a code can be defined as a representation of a theme. Additionally, a code is commonly referred to as a node. During the coding process, researchers closely examine the data to identify recurring themes and relationships. They then assign codes to categorise related sentences or words (Lapada, 2010). A coding framework was established using Nvivo 12 Pro software by utilising exported transcripts from a total of 15 interviews. The interview notes were thoroughly examined in order to identify any recurring patterns or themes using the Nvivo Pro 12 software. A code was produced to reflect each specific theme that was determined through a comprehensive assessment of the interview transcripts. The researcher proceeded to conduct a comprehensive analysis of the content of each transcript through careful reading. The analysis of the coded themes was conducted in order to fulfil the predetermined particular objectives and overall goals of the research.

3.7.2 Thematic analysis

In this research study, thematic analysis was utilised to analyse data and identify common themes. Thematic analysis as a method of data analysis was chosen because it allowed the researcher to identify key features of the data (Nowell, Norris, White & Moules, 2017). Moreover, thematic analysis allows the researcher to classify information into common themes/patterns (Braun & Clark, 2006). There are three main elements of thematic analysis, which include identification, analysis, and reporting of patterns situated in the dataset.

Through, application of thematic analysis, one reduces and manages a large volume of data without losing its authentic meaning. The type of data examined through the application of thematic ranges from interview transcripts, field notes, diaries, journals, memos, files, and photographsfiles (Lapada, 2010). Thematic analysis helps in understanding the frequencies of informationand gives a better comprehension of the relationship between themes within the dataset. I acquainted myself with the data by thoroughly reviewing and comprehending the comprehensive range of content encompassed within the acquired data, namely the transcripts of the interviews, which also included audio recordings of the proceedings. I engage in iterative examination of transcripts in order to transform unprocessed material into meaningful discoveries. The researcher made the decision to generate preliminary codes utilizing Nvivo Pro 12, a software designed for qualitative data analysis. The software assisted in classifying data based on text or word queries associated with themes or mostly used words within each transcript. Sub-themes were generated also for detailed analysis of the main themes. Five main themes were created, and these were the role and function of CCTV operators, occupational challenges, inter-collaborations with SAPS, the effectiveness of CCTV systems in the prevention of crime, and views on improving the current systems of surveillance in Cape Town. The researcher reviewed emerging themes concerning coded datasets, which provided a general sense of emerging patterns of the data. The data was arranged according to these themes, and the researcher wrote depth-analysis and provided an identifying narrative of each theme revealed. The identified themes became the basis of the discussion of findings and interpretation in which chapter 4 and 5 was written.

3.8 Ethical considerations

Ethics considerations play a vital role in research practice. The research study was approved and cleared by both the University of Cape Town Faculty of Law Ethics Committee and the City of Cape Town Policy and Strategy. Ethics in research are a set of norms that are applied to individuals when conducting research in any given field (Davis, Francis & Jupp, 2011). The standards serve as a set of principles delineating appropriate conduct for researchers within the realm of academic inquiry. The paramount objective should consistently revolve around safeguarding the human rights and preserving the dignity of all individuals involved in research endeavors. Ensuring the safety of research participants is of utmost importance for researchers. Bachman and Schutt (2011), assert that the Belmont Report delineated three fundamental principles aimed at safeguarding human subjects in research, namely: Respect for individuals,

Justice, and Beneficence. The primary objective of this initiative is to safeguard the human rights of individuals participating in research studies by promoting and encouraging researchers to strictly adhere to ethical principles and practices throughout the research process. Considering the significance of ethical issues in research, the following pertinent ethical issues were followed in ensuring that the study complies with social and criminological ethical principles.

3.8.1 Avoidance of harm

One of the main principles of research ethics is to protect the participants against any harm that might arise in the study. This is in line with the Belmont Report on ethics, which states that "do no harm" and maximise benefits and minimise harm. Considering this principle, the researcher ensured that no harm or any other type of discomfort was done to participants by professionally conducting interviews. I ensured that anonymity was practised throughout the interviews by using pseudonyms such as "P B" and "P A" in each transcription via the recordingand in the notebook used for field notes. This was done to ensure that no information linked tothe interview transcripts might be leaked and cause potential harm to the reputation of the participants.

3.8.2 Violation of confidentiality/privacy

Participants' confidentiality was maintained as pseudonyms such as "P A" and "P B" were used in each interview to protect the real identity of the participants. Each recorded audio-recorded interview transcript was kept in a secured password-protected file on a personal laptop of the researcher, and only the researcher knew the password to unlock the files. In addition, anonymised field notes were kept at a safer place where only the researcher had access. Otter. A.I., a digital recording software, was used to record each interview from all CCTV control centres. Each interview was anonymised as pseudonyms were used. In addition, each recording was deleted after data analysis and report writing.

Informed Consent form / Voluntary Participation

The informed consent form was sent in advance and distributed among potential participants. This was done with the assistance of gatekeepers who facilitated the distribution of consent forms to various CCTV control centres. At the start of all interviews, I read through the consent form with participants to make sure they understood what they were agreeing to do. Interview

recordings were done with the permission of the participants. The researcher made sure that none of the participants were not pressured to take part in the data collection, and all participants were informed that they could withdraw from the study at any given time.

3.9 Study limitations

The research study is subject to certain limitations, which pertain to specific aspects of its design or methodology that have had an adverse effect on the implementation and understanding of the research findings (Labaree, 2013).

The current body of literature in South Africa has a notable deficiency, particularly in terms of examining the role played by closed-circuit television (CCTV) operators. This has resulted in a disproportionate dependence on research conducted in Europe and the United States, which may not comprehensively capture the responsibilities and challenges faced by CCTV operators in South Africa. The predominant body of South African research pertaining to CCTV surveillance systems primarily centers on the utilisation, implementation, and evaluation of the efficacy of such systems in deterring criminal activities, encompassing both the public and private domains.

Gaining access to the research field and participants was also a challenge. The processing of the research request itself took a very long time to be processed through the appropriate offices. At first, gatekeepers were reluctant to cooperate as they had security concerns. An in-person meeting was scheduled with both gatekeepers, where I did a formal presentation of my research outline and the purpose of the study. Once those present understood the purpose of the research, they gave their cooperation.

One challenge was the delay and lack of processing of the research request letter. At one point, I had to make several calls and send emails to ask if the Policy and Research Strategy Unit had received my research request application. It was a frustrating and draining process to deal with. Moreover, we sent a research request letter to the Department of Metro Police instead of the Policy and Strategy Unit, which facilitates research involving City of Cape Town employees. My supervisor and I decided to restart the process again, which took almost 2-3 months for permission to be granted.

The relative inexperience of the researcher was another challenge that had to be dealt with. The non-probability sampling method posits that not all population members stand a chance or have

an equal chance of participating in the study, as opposed to probability in nature. The findings cannot be generalised since the study aimed at excluding other CCTV operators operating in the private security industry.

Time constraints also impacted on the scope of this inquiry. One of the shortcomings of this study included time constraints and exceeding research data collection stipulated in the approval letter from the City of Cape Town, which made the researcher reduce CCTV centres from 6 to 3, as was the initial plan. This resulted in targeting three main CCTV control centres within the City of Cape Town. The rest of the CCTV control centres were regarded as satellite (small centres), according to the City of Cape Town surveillance unit. However, one of the satellite centres was included in the data collection sample. Despite the study's constraints, the researcher was able to compile and analyse the data that served as the foundation for this investigation in chapter 4 of the dissertation.

3.10 Chapter summary

This chapter presents a comprehensive description of the research technique, research design, research approach, unimpeded observation, and research tools employed in the collection of research data. The methods employed for the analysis of the data collected from the three centres where prospective participants were interviewed. Furthermore, a succinct overview of the study's limitations was presented, and a comprehensive discussion of the ethical considerations was offered.

CHAPTER FOUR

DISCUSSION AND INTERPRETATION OF FINDINGS

4.1 Introduction

This chapter provides a description and interpretation of the findings based on thematic analysis. The research questions provided the framework data presentation and that under each emerging themes surfaced. These themes utilised included the following: the role function of CCTV operators, occupational challenges of CCTV operators, inter-collaboration with SAPS, perception, and experiences of CCTV cameras as a crime prevention tool, and their views on what can be done to improve the current surveillance systems. A brief discussion and illustrative quotes will be provided for each theme. By way of conclusion, a summary of findings is provided.

4.1 Theme 1: What is the role and impact of CCTV camera systems operators in contributing to efficient crime prevention in their larger security industry?

4.1.1 The role of CCTV operators

CCTV operators at all three CCTV centres across the city were asked about the role and function played by CCTV in contributing to efficient crime prevention. In answering this question, most participants from Centre 1, 3, and 2 understood their role as observing, detecting, and reporting crime for swift action where possible. They spoke about using CCTV cameras to detect crime, monitor and patrol via view-screens effectively and take action as appropriate to events seen on CCTV cameras. Several responses were obtained from participants across all three centres. These responses indicated that operators engage in various activities, including retrieving recorded audio, documenting instances of crime, sharing locations of crime hotspots that they monitor, and collaborating with law enforcement agencies and private individuals or organisations for crime investigations. Many operators may not fully comprehend the intricacies and workload of their task, yet one can perceive its complexity from a distance. The operators provided direct responses regarding their role and addressed specific issues pertaining to their daily tasks. In addition to fulfilling various monitoring-related responsibilities, operators are occasionally summoned to provide testimony in legal proceedings. None of the scholars in the USA and UK, including South Africa, have documented instances where operators are summoned to testify in a court of law.

To be specific, 13 participants out of 15 spoke about monitoring criminality within the location where CCTV systems have been installed and responding timeously. Participants responses from various CCTV centres are indicated by the following quotes:

> *Our primary task entails the systematic observation and surveillance of illegal activities within areas equipped with closed-circuit television (CCTV) cameras. Upon detecting any indications of questionable conduct, we proceed to track the individual in question exclusively through the camera network on a daily basis. I am just busy with cameras. (Participant A: Centre 1).*

> *Okay, our role is to prevent crime here in Cape Town mmh that is the main role because we are watching and monitoring Cape Town's CBD. Follow-up question: do you have cameras on the on the freeway operated by the city? "Yes, we do have cameras. We are the first eyes to see any accident on the freeway. Once we recognise any accident, we report it to our supervisors, and they quickly escalate it to the relevant authorities, such as SAPS and EMS. Sometimes, we use to communicate this through our two-way radio, or we use (EPIC) system. (Participant B: Centre 1).*

Some participants also referred to roles in responding to traffic congestion and reporting accidents, burst municipal water pipes and veld fires in the city.

> *We use CCTV cameras to report burst water pipes and malfunctioning traffic lights robots in City. We also record and report vandalism of city properties. Remember the fire that started in Table Mountain? Our cameras were used to capture that fire on the N2 roadside, and we alerted authorities. (Participant C: Centre 2).*

4.1.2 Formal requirements for surveillance operators

Respondents were also probed about the formal requirements for one to be a CCTV operator. Most participants indicated that they are required to have formal work experience in the security industry. Furthermore, surveillance operators are required to be registered with the South African Private Security Industry Regulatory Authority (PSIRA) to work as security officers operating CCTV cameras and hold a certain Grade as per PSIRA compliance (PSIRA,

2019). However, the shocking part was that one can be employed as a CCTV operator even if they do not possess a national Grade 12 certificate. If a candidate has experience in operating a CCTV, he/she is likely to be employed. Meaning there are no stringent requirements for one to be a CCTV. Consider the following.

> *Aaahh, look, it is not always the case that operators will be required to have a grade 12 certificate to be hired. I know some of my colleagues who do not have grade 12 certificates." (Participant D: Centre 1).*

> *Experience is very important in the CCTV environment this of having qualifications doesn't work here. You see, if you can catch criminals and understand the linkage of the cameras of the city, you are good to go. (Participant C: Centre 2).*

It is important to note that the literature on the formal requirements of a CCTV operator in South Africa is not well documented because the profession is not formalised, and security companies apply different recruitment systems. The United States of America, the United Kingdom, and China are actively advancing their surveillance systems, demonstrating a commitment to professionalising the sector. In contrast, South Africa lags in this regard.

4.1.3 Job dissatisfaction

A total of nine operators have voiced their concerns and dissatisfaction regarding the impact of job dissatisfaction on their responsibilities as closed-circuit television (CCTV) operators. The operators expressed their dissatisfaction when queried about their position, even though the participants were not being specifically interrogated regarding their job satisfaction with the company. Within a particular thematic context, participants were requested to assess their level of job satisfaction, revealing a prevailing pattern of discontentment pertaining to many aspects of their work environment. Consider the following.

> *We are also not happy about the working conditions of this place including and our salaries are not okay. I have 6 years working here, but every year, my salary feels like it still is the same. (Participant C: Centre 2).*

Another participant from Cap Town Centre with 10 years' experience highlighted some of the frustrations they have with the employer as follows:

There is just lack of support from our employer when we go to court to testify against certain individuals or criminals' behaviour recorded on CCTV. You go there alone without any protection. What if they kill you? We do sign consent forms to go but everything is on you, including transportation costs. Some of our operators sometimes are reluctant to testify due to fear. (Participant C: Centre 2).

4.1.4 In-house training of CCTV operators

As part of the inquiry into the operators, I inquired about the extent of their training, including if it is compulsory and accessible to all operators, as well as the availability of refresher courses. Approximately 50% of the participants reported having received in-house training from experienced CCTV operators. However, it should be noted that this training depth and frequency does not incorporate periodic refresher courses. Consider the following:

Yes, there is in-house training for every new operator. Before you can sit on your individual screen, you must first observe for some time from somebody else. (That) person will teach how to follow a stranger, suspects, linkage of the cameras, the things that you must see if someone is a suspect. This training takes two weeks for each person. (Participant C: Centre 1).

Having said that, operators do not receive a refresher course which aims at keeping up with the latest technology within the CCTV environment. It is fair to conclude that while the private security industry might be ahead of state policing apparatus in the use of policing technology, there is inadequate training to adapt to the new technology. For instance:

The last time I received a training on something new here it was when I joined the company. There is no refresher course or training I have ever received since ever, even that training you receive is not that hard. (Participant B: Centre 1).

One of the participants with 10 years' experience expressed his views by saying the training mechanisms changed over the past 10 years, and many learn on the job about certain techniques. Consider the following:

These days, training here is like two weeks. One week is enough training for the new recruits. It never used to be like this before. When I joined the centre,

you will be trained for like a month or two months, it used to happen in the old days but now is not. In the past, new recruits will be getting into taxis for the city to drive around and see where the cameras have been installed. (Participant E: Centre 1).

4.1.5 Costs and maintenance of CCTV cameras

A significant number of CCTV operations centres in big metros across South Africa have been operated and managed by contract security companies. The big metros in South Africa had outsourced the operations and maintenance of CCTV cameras. The cost and maintenance of the systems get the budget from municipalities each year to run surveillance. A privately owned security company is hired to maintain and manage the technical part of the systems, such as repairs and installations, while a security company manage and operates cameras. Cities persist in allocating funding towards the installation of closed-circuit television (CCTV) cameras, a decision influenced by the profit-oriented motives of security. These companies assert that CCTV camera systems are indispensable for mitigating and deterring criminal activities. In conversations with the Senior Manager of Metro Police and Surveillance, this was confirmed as follows:

The city …cover the costs of the cameras roll-out...- there is always a budget allocated to the installation of CCTV cameras, which must be approved by the city council and Safety and Security Portfolio Committee. (Interview no 02: 10 July 2022, Senior Manager of Metro Police and Surveillance City of Cape Town).

The implementation of closed-circuit television (CCTV) cameras within the City is incurring substantial expenses that escalate over time owing to unforeseen costs. In addition, acts of vandalism represent a significant contributing factor, resulting in substantial financial burdens for the city in terms of maintenance expenditures. The Manager refrained from disclosing the total expenditure incurred by the city over the past five years for CCTV installation.

During an interview with a Public Safety Specialist, she contended that numerous metropolitan areas across the country are allocating significant funds towards the implementation of closed-circuit television (CCTV) cameras, though they are not observing any discernible outcomes. She further argued that allocating the monies towards additional crime-fighting measures would have potential intended outcomes. Furthermore, she contended that CCTV is the most

expensive crime-fighting tool as opposed to dedicated boots on the ground. In the respondent's view, the implementation and advancement of self-reporting mechanisms, such as Geographic Information Systems (GIS), might yield advantageous outcomes in the realm of crime prevention and control within communities.

> *I think it has a negative impact because it diverts capacity and resources from more effectivity measures. It must also have some positive impact but, in my view, not enough to justify the investment, maintenance, and operating costs. (Interview no 2: 02 July 2022, Public Safety Specialist).*

She further suggested that the big metros in South Africa had outsourced the management and operations of CCTV cameras for safety reasons due to their lack of technical expertise in surveillance systems. Furthermore, the presence of financial limitations in managing the systems emerged as a significant barrier. Consequently, a more viable alternative for addressing this issue was to delegate the operations of the systems to security firms who possess specialised knowledge and skills in this domain.

City of Cape Town CCTV control room centres operate proactive surveillance as opposed to reactive surveillance. Actively searching for relevant occurrences in real time is part of proactive monitoring. In three of the operating centres, operators narrated how their control roomset-up requires them to be actively engaged in surveillance. The systems are designed in such a way that operators must look for live evidence and identify any criminal acts in real-time. This type of surveillance is response-based surveillance. It also requires a high level of situational awareness and sensitivity, including a quick reaction to the real-time event. In one interview in Centre 3, an operator was interviewed while conducting proactive monitoring. Theinterviewee was monitoring a protest in one location around a particular policing precinct. One interviewee had the following to say:

> *You see, now we are monitoring this protest in this location; I am also making calls to community policing forums and law enforcement to attend to it. (Participant A: Centre 3).*

Another interviewee put it as follows:

> *As part of our job, you don't just leave your workstation. We are doing a live monitoring here. If you leave your workstation, you must tell the person next*

to you to look after your cameras. We normally do it when we go to toilets. (Participant D: Centre 2).

It is accepted that most surveillance operations conduct proactive monitoring, which requires a high level of alertness. However, this is not always the case. There is an informal side to the CCTV setting. In an interview with a public safety specialist, she explicitly stated that CCTV control rooms have the other side that the public does not know. She was quoted as saying the following:

It's very interesting! The other day, I was in Durban and had to sit in the disaster board room, and the CCTV control room is right next door…and it was lunchtime, I only spotted one person left in the control room, and she was asleep (laughs). (Interview no 1: 02 July 2022, Public Safety Specialist).

A participant affiliated with Centre 1 expressed the belief that proactive surveillance is present and constitutes a significant operational practice within the surveillance environment. However, they acknowledged the challenges associated with maintaining this practice since it demands a high degree of concentration, and they can't keep up with it. She was quoted as saying the following:

We can't always be focusing on screens for too long, sometimes you think of other things at home, … and now you need to focus here there are big screens which need our focus. We sit and watch screens every day for 8 hours, and we are required to detect incidences. We get tired. (Participant D: Centre 1).

We go to the bathroom and to the kitchen to get water and something to eat. It is not always the case that when you report that you are going to the bathroom, that the person you report to will be available (to watch your camera), including our supervisor. They also have their cameras to watch and jobs to do. While I am away for those minutes, a lot can be missed on the screens. (Participant A: Centre 1).

They have the responsibility of reporting incidents in their occurrence book should police request the nature of the incident, the time of day, and the location. An occurrence book can be used as a reference or record for the incident. One of the participants demarcated their responsibilities as follows:

We don't get involved in tasks such as compiling monthly crime and incidents stats and retrieving recorded videotapes for investigations or any other incidents, which is not our job. Our supervisors do that.' (Participant B: Centre 1)

Two key sets of functions emerged from the interviewee data, namely, monitoring crime incidences and the prevention of crime. In their reflections on their role, operators would first talk about their role in crime prevention, the need for observing any illegal activities, supporting law enforcement operations, and, through such activities, promoting public safety.

4.1.6 The number of incidences required to be recorded

As monitoring and reporting of incidences were dominant themes, participants were further probed about the number of incidences they reported on average per week. Most participants indicated that they register and report a lot of crimes and other incidents. In addition, they are also required to report the number and location of non-functional cameras. The consensus view was that they are all required, as per their job description, to 'spot' incidences. Operators also mentioned that occasionally, they fail to detect certain incidents, and as a result, they may face disciplinary measures for such behaviours. Moreover, they stated that it is not always possible to collect the necessary number of incidences as per the policy. As a result, this put pressure and mental distress on operators. According to one participant:

We monitor and report incidences every day on our occurrence book. CCTV operators were required by our supervisors and the client to have incidences. If not, they would think you are not working, and you will be in trouble if you miss an incident. We can report and register more than 20 incidences per week from each of us in this building. But we don't know how many people are arrested and prosecuted for the crimes we reported as our bosses do not give us feedback about the incident. (Participant F: Centre 1).

Another participant said the following:

In the occurrence book, you must record almost everything as long it is operation. Mostly, we record the incidences (as well as) damaged or offline cameras because if you do not report any of these offline cameras, how would

management know that we have cameras that are off. (Participant B: Centre 3).

Despite the certain participants acknowledged the occurrence of missed incidents that can lead to punitive measures, which happen more frequently than one might have anticipated. Individuals must exercise vigilance in a monitoring environment; nonetheless, it is important to acknowledge that errors are inherent and unavoidable in such contexts. As exemplified by a female participant from the Centre 2.

We do miss crime incidence here, my brother .... mmmh mostly it is because of a lack of focus and mental fatigue and sometimes having small conversations with a colleagues or broken cameras and screens, and again, on my console, I work with 20 cameras. How do not miss incidence operating too (many) cameras…For me, this is too much. We used to have two people per console around 2017. One was the observer, and one was the operator, but this was changed due to budget cuts, and this has brought a lot on us operators; hence, we miss incidents. (Participant C: Centre 2)

4.1.7 Monitoring and suspicious behaviour

We are also required to be very careful to identify any suspicious behaviour. I mean, how do you control and prevent crime if you are unable to identify suspicious behaviour and read the body language of a criminal or a car that intends to commit a crime? In addition, as CCTV operators, we must identify a normal person and a criminal who is about to do something. We also pay careful attention to crime hot spots. If I am observing 10 cameras and 4 of them are monitoring crime hot- spots, your attention must always shift (back) to those four cameras. (Participant B: Centre 2).

You see, most of us here were taken to training so that we can know the place and understand where cameras are installed. You cannot work in the CBD while you do not know the streets and Cape Town CBD. We are also trained to operate in malls and estates areas. Our training is general training of operating CCTV cameras. (Participant C: Centre 1).

Understanding suspicious movements and behaviour is one of the integral parts of the surveillance environment, and if one does not possess such skill, he or she will fail to detect crime within the monitoring areas. Operators alluded to monitoring a lot of cameras. Regardless of the number of cameras, their alertness level should always be high. Interviewees also indicated that they experience mental fatigue and eye strain from sitting in a room for 8 hours a day and watching virtual on big screens. This is a lengthy period for operators to function effectively and efficiently.

4.1.8 Selective monitoring by CCTV operators

CCTV operators were also probed on how they conduct surveillance monitoring and predict anti-social behaviour. In two of the CCTV centres, operators agreed that a particular criterion is applied as part of surveillance practise. This criterion is that of selective monitoring in looking for anti-social behaviour. In two CCTV operations centres, the majority of the respondents indicated that crime hotspots received the most attention, with fewer surveillance resources allocated to other areas. The interviewees also stated that certain types of people were the target of this selective monitoring. Homeless people in the taxi rank side of Cape Town and on the station, deck were targets as they are usually accused of dealing drugs and committing common robberies in the evening and in the morning when it is busy. This theme emerged more often from two of the centres but not Centre 3. Consider the following:

> *We also have a problem of drugs dealers here in Cape Town. You see there by the taxi rank and station deck. There is a serious problem, even now I can show you on our cameras now…Mmhhh and they are always our target when we are conducting monitoring, and we know where to catch them. (Participant B: Centre 1).*

These targeted people are considered to have a high predicted value of threat, thus becoming a focus of the operators when conducting monitoring in those areas. One of the interviewees from Goodwood was quoted as saying the following:

> *Yes, there are specific places that are considered to have many crimes recorded on a weekly or monthly basis. We are typically instructed to concentrate on certain areas due to the high crime rate, and we are aware of who to watch out for and where. (Participant E: Centre 2).*

4.1.9 CCTV cameras collect evidence

In explaining their role in using CCTV cameras as a crime prevention and control technique, operators spoke about how CCTV cameras play a significant role in capturing and recording live evidence. Most participants thought that CCTV cameras were crucial in a court of law by providing evidence that someone was in a certain place, or he/she was a suspect who could be charged for a crime captured by CCTV cameras. In addition, operators indicated that it was important to keep records of the incident by using an incident recording book. Information such as the time, day, and location of the incident is kept in the incident book, including the operator's name.

Of the 15 participants, only one participant spoke about the dangers and risks they faced when they had to testify and provide evidence in court. According to this respondent, their lives were put at risk, and there was a lack of support from both the City of Cape and their security company. Consider the following:

> *As operators, we are sometimes expected to testify in certain cases, and this put our lives in risk and danger. We really don't get assistance from our company or our client. (Participant A: Centre 1).*

Participants also spoke about the number of people arrested through CCTV cameras who were convicted because of evidence provided to the court by operators in proactive surveillance. Some of the interviewee's quotes regarding the collection of evidence and the risk and danger they face were the following.

> *Our CCTV cameras captured and record events for live evidence purposes. Our recordings are mostly used in a court of law, including insurance companies who want to access vehicle accidents. Investigators of the Parliament fire incident came here to ask the recording of the incidence ... but unfortunately, our camera on that day of the incidence was offline that side. (Participant B: Centre 1).*

It has been commonly believed that closed-circuit television (CCTV) operators primarily focus on monitoring criminal activities. However, through this research, it has come to light that these operators engage in a range of work-related tasks beyond simply observing camera feeds throughout the day. Another notable finding is that operators are responsible for monitoring

not only crime-related incidents but also various other events such as burst water pipes, accidents, veld-fires, traffic congestion, and building fires within the city. One of the participants articulated this perspective by discussing the recent burning down of the National Parliament. However, the participant emphasised that during the incident when the National Assembly was set ablaze, one of their cameras was inoperative, thereby preventing the documentation of the events preceding the destruction of the building.

Operators must have a full understanding of the operations of CCTV, such as camera linkage and crime hotspots. Operators are further required to be perceptive, have a high level of focus, and be able to divide their attention to watch many events if they are to carry out their jobs effectively. In an interesting interview I had with one operator in at Centre 3, the operator who was alone on the day of my interview went to the bathroom and left the cameras and talk-radio unattended for approximately 10 minutes. This contradicts the principles of vigilance and 24/7 monitoring of the cameras by CCTV operators.

In the same Centre where I conducted interviews, one of the operators, after the completion of our interviews, went for a smoke break, which lasted for about 7 minutes. This took place during the second leg of the interviews. This is the informal sub-cultural practises of the CCTV environment, which is not well documented. The inherent characteristics of CCTV control centres can expose operators to cognitive lapses while engaging in proactive security surveillance. Cognitive and perceptual overload may occur when information is presented on multiple screens, wherein each screen exhibits visually complex scenes of bustling public environments which require the attention of the operators.

It is important to note that there are control room practises which contribute to crime prevention and control. Nearly half of the operators were putting more monitoring resources on crime hotspots. The redirecting of resources to monitor crime hotspots will lead to poor monitoring of other areas within the city. In addition, operators are required to capture and register a certain number of incidences per shift. In addition, it also emerged that, at times, a week could go past without an operator registering a single incident as per the requirement of their employer. In addition to this, the very same operators felt that CCTV cameras do not prevent crime, contradicting the official line from other colleagues.

4.2 Theme 2: Occupational challenges related to everyday CCTV control room operations (cognitive challenges)

Participants were also probed about occupational challenges in their control room setting. The general response to this theme was that each CCTV control centre had its challenges, which impacted negatively on the day-to-day operations of CCTV control centres. Some challenges were considered unique, and some were common in all centres. The data revealed challenges such as faulty equipment, load-shedding, cameras going offline in crime hotspots, cable theft, vandalism, delays in the maintenance of faulty camera systems, eye strain, trees obstructing cameras' vision, and lack of response teams on the ground. Almost 15 participants narrated about offline cameras and faulty types of equipment, which made their work difficult in reducing crime. Load shedding was considered the second biggest challenge, with 13 participants stating that when there is no power, they are unable to monitor and observe. Only the Retreat CCTV centre also mentioned staff shortages. Almost half of the participants also spoke about severe weather sometimes negatively impacting camera vision, thus risking missing incidents.

4.2.1 Faulty equipment

Participants shared how offline cameras, faulty equipment, and poor linkages of cameras impact their every work negatively. Given the dependency on CCTV cameras as an extra measure for crime prevention, consistent technical glitches make it possible for criminality to thrive without any disruption of cameras, as the eye of law enforcement. Interviewees stated that they would report such technical faults to maintenance. However, the turnaround time to fix faulty equipment was poor. In some of the work-station CCTV cameras did not show on the screen due to being old or damaged. The broader consensus seemed to be that there is a massive problem of faulty cameras and other technical glitches impacting negatively on the use of cameras. Consider the following:

> *One of the biggest challenges is our offline cameras. You see now there are two cameras in Manenberg, one in Bellville intersection that hasn't been working for about two years now, and we had reported it to the repairs team a long time ago. (Interviewee B: Centre 3).*

In addition, more participants from other CCTV centres also mentioned offline cameras and faulty equipment as key concerns in their everyday operations.

Some of the cameras in crime hotspots in the CBD are not working. For example, if you want to follow a car that has committed a crime or a suspicious person, it is very difficult to do it because you find that one camera or two are faulty and blurry. Expect nothing but the poor linkage between the broken cameras. We report it, and if it does not get fixed, then we are blamed when we miss an incident. (Participant F: Centre 1).

Ok, another problem we have with our cameras is that they sometimes switch off while operating. You will have a situation where they move in slow motion, and once the cameras are moving in slow motion, you just know that you are likely to miss that incident, and you will never find that person you were chasing or the incident you were following. (Participant A: Centre 3).

4.2.2 Power-cuts

Power cuts were one of the second biggest predicaments which dominated occupational challenges faced by the CCTV operators from all three centres. 13 participants stated how bad it can be when the power is off. Even though CCTV centres such as Centre 2 have generators, cameras are not fully functioning compared to when there is power available. Participants shared that they do not expect the smooth operation of CCTV cameras during power outages. Some of the respondents mentioned the following.

Aah, look, there are always operational challenges, but the biggest we have is loading shedding. Load-shedding is one of the problems that we are faced with here because immediately it kicks in, we are unable to monitor all CCTV cameras because some are off, and crime doesn't wait for electricity to be back. (Participant B: Centre 1).

Follow-up question: is the centre equipped with a generator to assist in times of load shedding?

Yes, we do have an in-house generator. We do not have the luxury of going down for an extended period because we know that once we are down, the eyes in the city are also down. (Participant B: Centre 1).

On the technical side of our challenges with cameras is that load-shedding has been giving us a problem. When the power is off for about 2 hours,

everything in this control room is off. So now, when the power is back when we have missed a lot of incidences, some cameras do not come online immediately. You have to wait for an hour for it to come online. Again (here at Retreat), we do not have a generator here like other CCTV centres. (Participant A: Centre 3).

Throughout the interviews, most participants indicated that load-shedding was one of the difficulties they had to deal with daily. Whilst two centres had access to generators, the use of the generator was not enough to assist operators in monitoring and observing as some of the cameras would go offline.

4.2.3 Inadequate law enforcement response time

Poor response time from law enforcement was also identified as a problem operators had to contend with daily. Participants shared that there is a big problem among law enforcement agencies regarding response time. Nine participants shared that police/ law enforcement do not respond timeously to reported incidents by CCTV operators. Consequently, this results in poor and inadequate response time. In addition, participants shared that they do not have direct law enforcement except the metro-police CCTV camera unit, which at times is not available to respond timeously to incidents. In this case, the South African Police Service assisted but not as timeously as one would expect. Participants also shared that one of the key concerns is that they do not have a dedicated team from Securitas who would specifically respond to their incidents on time. One participant was quoted saying the following:

When I say there is a lack of response, I mean that…Mmh, let's say now you pick up a crime on your cameras, and you make a call to law enforcement. By that time, there is no one to help you at that moment. (Participant F: Centre).

Poor response time by law enforcement was considered a consistent problem even at other control room centres. One of the participants in Centre 3 (who happens to be a supervisor) corroborated this view as she was narrating a plethora of challenges they face daily.

The biggest challenge for us is the response time from law enforcement…because the specific areas we are monitoring, there is lot gangsterism and violence on daily basis, the areas of Lavender Hill, Montagu

Village, Hillville. One would expect the police to respond timeously. One more problem is smash and grab in many of our intersections. You see it and call the response team, but they are not there, or they might come after 1 hour…Mhh, and these criminals are very quick, and by the time response arrives, they are gone. (Participant A: Centre 3).

4.2.4 Staff shortage in the Centre 3 control centre

Two of the participants based at Centre 3 highlighted a shortage of staff as one of the problems they have made peace with. They indicated that the lack of staff at their centre might be that the centre is regarded as a satellite (small); hence, the lack of resources, including additional staff, is a problem. They indicated that they feel neglected even though they are monitoring and observing some of the most violent areas of the city. Unlike other CCTV centres, the Centre did not have a police officer attached to the it. Some of the views captured in the discussion include the following.

One more challenge is that we are understaffed in this centre, and this makes us work overtime. We do not have enough time to attend to other families' issues or even spend time with them. However, there is nothing we can do because we want to feed them with this salary we get here. (Participant A: centre 3).

There are only two during the day, and the night shift consists of three operators. Imagine watching these cameras every day alone. And as humans, we get sick. What will happen if one of us is sick on a certain day? It means I will have to work alone on that day monitoring these cameras you see here. (Participant B: Centre 3).

4.2.5 Vandalism and cable theft

Participants were further probed about other occupational challenges. Participants indicated that vandalism of city infrastructure and theft of fibre cable had a negative impact on their everyday operations. Seven out of 15 participants shared that they experienced lot of vandalism and cable theft connecting CCTV systems cases. Vandalism and theft of fibre cables were experienced mostly by Centre 3 and 2. Visible law enforcement within CBD and other areas covered by the Cape Town control centre was seen as the cause of reduced

vandalism and theft of fibre cables in contrast to other centres. In my interview with the Senior Manager of CCTV of the City of Cape Town, he reliably informed me that the Eastern part of the city experienced more vandalism and theft of fibre cables connecting CCTV cameras between 2020/2022. Some of the participants were quoted saying the following:

> *Vandalism and theft of fibre cables is one problem we are facing more often, and our systems are heavily affected by this. You report it, and technicians will tell you that fibre is expensive, and they will install and replace fibre maybe in two months or three and by the time our cameras will be off for that period. And our hotspots of vandalism include Khayelitsha Site C, Nyanga, Bonteheuwel and Manenberg. (Participant D: Centre).*

> *We struggle a lot with the problem of cable theft and vandalism. When criminals steal cables, we are also affected. Remember, our cameras work with electricity even though there are some which use solar power, but most of our CCTV systems use electricity. (Participant F: Centre).*

According to participants at Centre 2, vandalism and theft of fibre are not common within the CBD.

> *We rarely have vandalism and theft of cables this side. You know our cameras are mostly monitoring CBD and places such as Sea Point, Greenpoint, and Observatory where we have enough law enforcement patrolling, so we have few cases of damage to our infrastructure. (Participant B: Centre 1).*

Instances of vandalism targeting the City's equipment, specifically cable theft, appear to be concentrated in specific areas of the city rather than the central business district (CBD) and its surrounding regions. This was influenced by the presence of visible security patrols, encompassing both private and public policing mechanisms. The townships of Cape Town are currently facing a significant issue of theft and vandalism, which can be attributed to inadequate policing mechanisms in contrast to the central business district (CBD).

One notable observation from the issues encountered in three of the Centres pertains to the inadequate distribution of resources to each centre. The operators are expected to consistently operate at a high level of effectiveness, but this is unlikely to be achieved if there is a scarcity of resources. Moreover, operators consistently expressed their displeasure with inadequate

provisions of work tools. In their view, management was not responsive to their concerns about insufficient resources. The environment of a closed-circuit television (CCTV) system experiences several transformations over its lifespan because of technological and environmental advancements. However, three of the Centres seem to be moving slowly to adapt to new technologies even though the centres are operating and using better CCTV camera systems.

In addition, one of the observations made and discovered was job dissatisfaction, which was previously discussed in theme one. It is linked with organisational challenges in a way that affects morale, comfort, good energy, and attitude towards their profession as CCTV operators. In addition, the experience of work dissatisfaction among employees has the potential to generate feelings of frustration, indifference, and demotivation. Such feelings have the potential to generate a cascading impact, influencing the overall ambience and levels of employee involvement inside the control room. The existing body of literature from the South African perspective on surveillance and systems lacks substantial discussion of the allocation of resources, which certainly has a crucial contribution to the overall success of CCTV systems.

4.3 Theme 3: Collaboration between the South African Police Service and CCTV operators

Participants were probed about the relationship they have with law enforcement agencies, specifically the South African Police Service. Whilst 10 out of 15 participants felt that whilst they have a 'good relationship' with the police members, the relationship was not considered strong enough. They indicated that they have a dedicated SAPS member attached to Centre 1 and Centre 2 to escalate or report crime incidents for a response on the ground. Operators shared that during their proactive surveillance monitoring, a police officer attached to both centres assisted with mobilising immediate police support. Five of the participants, however, were more critical and held different views. They discussed how slow police response times were and how police sometimes refused to respond to reported crimes. In addition, they reported a lack of cooperation between law enforcement agencies in the City of Cape Town, including SAPS. This dearth of cooperation negatively impacted the relationships between law enforcement agencies. The contrasting views are reflected in the responses below.

> *We have a good collaboration because we are working together. Everything that is happening outside, we call them. We can't go out on the ground to*

patrol. We need them, and they need us for combating crime within the city. We assist each other. They are always there for us. (Participant F: Centre 1).

Other participants were more critical of inter-agency working relationships. For them, the tardiness of the police's response time to reported incidents showed the existence of poor collaboration between them and the police. Consider the following:

SAPS! (laugh) Our relationship with SAPS is not good because you can send a complaint right now right, but they will come after an hour, same as metro police. (Participant C: Centre 1).

4.3.1 Communications systems with the police

The participants were subsequently queried on the extent of their communication with the South African Police Service (SAPS) in relation to the incidents they had reported. The comments exhibited a range of perspectives, as two operators of Centre 3 expressed the challenge of accessing the South African Police Service (SAPS) in critical situations, for instance.

We do phone them, but it's hard to get hold of them. Sometimes, we have to phone them two to three time asking for assistance, but they will come in their own time…so with SAPS, we are fighting a losing battle there. You see, other centres have access to police attached to them, including on-site metro police, fire and rescue department, law enforcement. They have everything they need. (Participant A: Centre 3).

In the event of an incident, we promptly contact the police and other law enforcement personnel who are present at the scene, and the first responder to arrive provides us with assistance. The reaction time for incidents is a matter of great concern for all law enforcement agencies, with the police being particularly affected by this issue. The majority of our dependence is placed upon municipal law enforcement agencies. (Participant B: Centre 3).

4.3.2 Consequences of poor collaboration and communications and responding to reported incidence

Inadequate communication and a dearth of collaboration between the police and city law enforcement can potentially lead to disastrous outcomes, particularly if conflicting approaches are taken, and there is a failure to align actions with stated intentions. The efficacy of crime-fighting initiatives, such as the installation of closed-circuit television (CCTV) systems and the utilisation of drones, may be compromised when poor relations exist. Consequently, there will be a significant risk of these initiatives being ineffective and resulting in the misallocation of taxpayers' funds. CCTV operators are likely to resort to City law enforcement agencies for reporting incidents, even though these agencies are already burdened with excessive workload and are unable to address the bulk of reported incidents. As one of the interviewees put it:

> *In most cases, we are bound to call the metro police and law enforcement response unit which is also not available to accommodate large number of incidences, you will make a call and they respond after crime has occurred. (Participant B: Centre 2).*

> *The City of Cape Town, I would say, if they could swallow the pride and build a decent relationship with the national and provincial police, surely, they would have a very different picture of crime prevention in the city. (Interview 2: 02 July 2022: Public Safety specialist).*

One operator from Centre 3 had expressed her unhappiness with the collaboration and service they receive from SAPS as follows:

> *It is upsetting because SAPS sometimes take a while to respond when we report crime incidents. They occasionally direct us to Metro Police, then where does this put our collaboration? So, in our centre, we do not have that good relationship with them. Yes, we do call them for assistance, but we struggle a lot. (Participant A: Centre 3).*

Responses to the question about working relationships between surveillance operators and the police were mixed. In two of the Centres, respondents reported good working relationships, particularly in Centres where operators could benefit from the permanent deployment of a police official. This on-site presence seemed to facilitate interaction between the role players.

The control room must possess communication systems that facilitate seamless connection with law enforcement agencies and other pertinent authorities; however, this seems to be not happening with the City of Cape Town CCTV control room centres. Therefore, operators in Centre 3 and a few others who had different thoughts from the two centres perceive it as one of the issues that contribute to the deteriorating relationship between the City of Cape and the South African Police Service. Furthermore, the ability of the police to respond promptly, as anticipated, is hindered by a range of internal and external problems associated with public policing and crime prevention in Cape Town. This further exacerbates the already strained relations.

Furthermore, in accordance with the constitution, it is incumbent upon them to fulfil their responsibilities in terms of crime prevention, regardless of the challenges that may arise. However, there are existing issues that the operators may not be aware of. The ongoing public dispute, predominantly covered by the media, about police powers between the law enforcement structures of the City of Cape Town and the South African Police Services is a concerning issue as it has a detrimental impact on the relationship between the two, thus affecting crime-fighting initiatives. Collaborations between SAPS and CCTV operators do exist; however, they are not based on confidence and trust, which are essential to addressing crime prevention and control within the city. The focus on collaboration was primarily targeted towards officials from the South African Police Service (SAPS) who are responsible for crime prevention and combatting, in accordance with the provisions outlined in the constitution.

4.4 Theme 4: Perception of the effectiveness of CCTV cameras in preventing crime within the City of Cape Town

The operators were also asked about the efficacy of closed-circuit television (CCTV) cameras in deterring criminal activities within the urban area. Out of 15 participants, 10 operators expressed the belief that closed-circuit television (CCTV) cameras have played a role in effectively mitigating criminal activities within the city. The respondents found the weekly crime figures collected by the surveillance centres to be evidential support for the favourable impact. The apprehension of individuals implicated in anti-social activities, as documented through the investigative capabilities of surveillance cameras, also serves as evidence of the crime-reducing effects of surveillance technology. Other factors contribute to the persuasive impact of closed-circuit television (CCTV), which includes the apprehension of offenders facilitated by the deployment of surveillance. Five participants expressed their dissenting views

regarding the effectiveness of surveillance in preventing crime. They argued that despite the presence of surveillance measures, instances of criminal activities such as common robberies, smash-and-grab incidents, and various forms of violent crimes continue to persist within the communities of Cape Town. Two of the participants provided visual representations to convey their perspectives on the positive impact of surveillance on crime trends.

> *You see, here in Town, we use to have crime hotspots on that side of the Taxi rank, but we have managed to make arrests using CCTV surveillance on that side, even some buildings where criminals would hide have been closed. (Participant C: Centre 1).*

> *Previously, it was not safe to walk some of the streets of the city, but now things have changed. We have law-enforcement personnel on the ground with the assistance of CCTV surveillance systems. Back in 2013, when I joined the centre, we had a problem of crime in Ceneta Park, but so far, we have managed to reduce it. So yes, I think CCTV cameras have reduced crime, and they are effective. (Interviewee: A Centre 1).*

Few participants, however, were far more critical. For them, CCTV cameras do not prevent crime because communities in Cape Town continue to experience high levels of crimes such as common robberies, smash-and-grab, and other violent crimes. As one operator put it:

> *Even though we are trying to prevent crime, I don't think CCTV has helped to reduce crime. Look at the level of smash & and violent crimes in our townships. We still record incidences of crime every week. (Participant C: Centre 3).*

This narrative was based on various factors, such as detecting crime before it happens, that criminals are less likely to commit a crime if they are being watched, and that the installation of cameras at certain crime hotspots assisted in the reduction of crime.

> *Yes, I think CCTV cameras can prevent and control crime…. I am saying this because of the number of arrests and incidences we recorded since I became a CCTV operator here in this centre. Cameras make any criminal think twice before he commits any type of crime because he is being watched. Some of*

them these days even check the position of the cameras before committing the crime." (Participant F: Centre 3).

Contrary to this view that CCTV cameras can control and prevent crime, three interviewees (one from Centre 1 and two from Centre 2) stated that the impact of CCTV cameras is curtailed by faulty equipment, technological glitches, ongoing power outages and lack of responders. In addition, they argue that CCTV cameras cannot prevent crime on their own because they require foot soldiers and proactive responses. Consider the following:

I do not think so. Let's say, for example, now some of our cameras are off in Khayelitsha, so where is CCTV in preventing and controlling crime in that area if the cameras are off? You see, that is not preventing crime- even if you spot something on camera six and report it, who is going to respond? You alert the police. Then they tell you the van is already out. (Participant D: Centre 3).

You can't prevent crime with these things even though we are operating them every day, but to say they will prevent crime is another story. We monitor most parts of the townships in Cape Town, what we see on cameras is not going to stop now due to many reasons. We try, but it seems that we are not winning against crime. (Participant A: Centre 3).

The preceding replies were provided by two operators situated in Centre 2 primarily responsible for monitoring the townships of Cape Town. According to discussions with the Senior Manager Metro Police and Surveillance, this centre is purportedly recognised as one of the primary centres with a high incidence of reported criminal activities.

In a conversation with a public safety specialist who wished to remain anonymous, she did not agree that CCTV cameras prevent crime. She argued that CCTV installations have far less effect and have a minimal role to play in crime prevention and control. Regardless of these big metros in South Africa, investing a lot into the policing system and expectations of the systems are way too high. She further indicated most of these municipalities in South Africa are caught in a trap of failure. Even though cameras are there, people are used to cameras and are unlikely to be deterred from committing crimes because of having cameras. She further indicated that people these days even post their criminal activities on social media themselves, and the level

of recidivism is high, which indicates that they do not mind the consequences of being caught enough to not commit a crime. Consider the following.

> *I don't think CCTV installation for crime prevention is useful. The evidence does exist that CCTV has little potential to prevent crime. There is no value in the investment of CCTV cameras. It is just overrated and is a waste of money from metros. (Interview no 1. 02 July 2022, Public Safety Specialist)*

Further remarks made coming from the conversations were that the City of Cape Town employs policing methods and mechanisms that result in the criminalisation of homeless individuals. The surveillance cameras of the city mostly focus on homeless individuals and petty criminals. She further contends that this strategy of policing warrants reconsideration to optimize the allocation of public resources. Furthermore, she suggested that this approach appears to be a strategic and convenient method for apprehending them. Consider the following.

> *The City of Cape Town criminalise homeless people and easy targets who commit petty crime. This overburdens the systems. CCTV help them to do this, but the City of Cape Town has a different view on the systems that they prevent crime. I mean, the city can direct such resources to more beneficial crime prevention strategies. (Interview no 2: 03 July 2022, Public Safety Specialist).*

In another interview with the Senior Manager of Metro Police and Surveillance for the City of Cape Town, it was explicitly asserted that closed-circuit television (CCTV) cameras serve as a deterrent and facilitate the management of criminal activities. This view was grounded in personal success narratives and the utilisation of monitoring tools, such as crime figures obtained from operators. Crime data are utilised to assess the efficacy and fulfilment of the public safety mandate by the systems in place. The city has had significant outcomes over the past decade because of the proactive and reactive characteristics of CCTV camera systems. Furthermore, over the years, they have successfully resolved several cases with the aid of surveillance cameras, leading to an increased allocation of resources towards the implementation of surveillance-based policing throughout the city. In addition, he contended that they remain resolute in their commitment to ensuring the safety of Cape Town communities. Consider the following.

> *Our implementation of closed-circuit television (CCTV) cameras as part of our crime prevention measures has proven to be effective in mitigating and diminishing criminal activities within the city. The significance of the arrests made and the accumulation of criminal incidents over the years is noteworthy. It is important to acknowledge that surveillance cameras have the capability to capture events that may otherwise remain unknown to the public. Furthermore, our cameras possess statistical data pertaining to individuals who have been apprehended, we also retain footage for investigations purposes. The City CCTV camerashave played a pivotal role in numerous success stories… (Interview 2: July 5, 2022 – Senior Manager of Metro Police and Surveillance, City of Cape Town).*

Even though surveillance technology has gained popularity to deter and manage crime, certain operators expressed scepticism over its effectiveness in reducing and preventing crime. Specifically, the respondents in this study were operators who regularly handle closed-circuit television (CCTV) systems, and one would not expect such comments from people who are tasked to keep communities safe. However, it was startling to observe the contradictory views pertaining to the crime prevention component of closed-circuit television (CCTV) cameras. While management expressed confidence in the efficacy of closed-circuit television (CCTV) systems, operators held a far lower level of confidence due to several reasons. This finding is significant in enhancing our understanding of the influence of closed-circuit television (CCTV) cameras on crime prevention, as reported directly by the operators themselves. The City of Cape Town persists in allocating increased resources towards the installation of closed-circuit television (CCTV) cameras, notwithstanding the little observable effects within local communities in Cape Town. The existing body of study literature has thus far failed to yield conclusive data regarding the efficacy of crime prevention measures of CCTV cameras in Cape Town. A limited number of success stories have been documented and disseminated, although the municipal authorities in Cape Town hold different perspectives on the systems, resulting in their extensive extension.

4.4.1 Operator perspectives on surveillance systems.

In Chapter 2, I drew on two environmental criminological approaches to explain how CCTV can be used to prevent and control crime. Routine activities theory argues that for a crime to occur, three elements must converge in time and space: a motivated offender, a suitable target,

and, in the absence of capable guardianship. Crime Prevention Through Environmental Design, as the earlier discussion emphasised, is aimed at modifying the physical environment to limit opportunities for criminality. Key principles included the utilisation of natural surveillance, access control, territoriality, and maintenance. In terms of the theoretical ideas embraced by both these perspectives, much significance is attached to the crime-reductive potential of surveillance through CCTV cameras. With vigilant operators in place, so the argument goes, the detection of troublesome behaviour on the street is a critical step in the process of targeted intervention aimed at both controlling (reactive) and preventing (proactive) crime.

According to the research findings of this study, the majority of operators were of the opinion that CCTV cameras can serve as a crime deterrent and contribute to the reduction of crime. For them, however, there was a disjuncture between theory and practice. Based on their experience, CCTV cameras often did not function optimally. Malfunctioning parts, inadequate maintenance of technological infrastructure, incidences of vandalism and power outages affected the use of surveillance cameras. Therefore, operators questioned the extent to which CCTV cameras functioned in practice as capable guardians. Furthermore, even if CCTV cameras were operative, they pointed out that crime incidences still occurred notwithstanding efforts aimed at environmental design aimed at crime reduction. An additional factor that influenced their views on the limitations of CCTV cameras was that operators were not sufficiently knowledgeable about the actual crime reduction impact associated with the usage of surveillance. As they indicated, none of the resolved cases or incidences involving the use of CCTV cameras are shared with them, therefore limiting their ability to observe the actual impact of CCTV cameras as a crime prevention tool. As the findings of this study indicate, operators were more muted in their appraisal of whether the surveillance systems they operated constituted crucial components of capable guardianship. CCTV operators undergo training in the application of ethical principles to surveillance practices. Nevertheless, they encounter uncertainty over the appropriate circumstances and methods for refraining from infringing upon the privacy of the public. They believe that closed-circuit television (CCTV) is the sole means of enhancing safety, therefore justifying the trade-off of privacy invasion. Consider the following:

> *As CCTV operators, we monitor and report suspicious behavior in a public Space, and sometimes, we go over the limit and zoom for security purposes. (Participant C: Centre 3).*

4.5 Theme 5: Recommendations for improving surveillance systems

As part of this inquiry, operators were asked their views on how best to improve the current systems. There were many suggestions for improvement. Most participants shared a variety of solutions, such as the installation of more CCTV cameras, improving camera linkages, as well as installing more advanced technical equipment. Whilst each CCTV centre had its own set of challenges, operators were unanimous about the need for fixing and improving the turnaround time for faulty equipment. Broken CCTV cameras were an issue of huge concern for operators across all three CCTV centres. Some of the participants stated the following as part of the solutions to the current surveillance systems.

> *We need more installation of cameras with advanced technology for this centre. We do not have enough cameras in areas such as Khayelitsha and Hanover Park. They also need to find a way of preventing vandalism. (Participant C: Centre 3).*

Another participant from Centre 2 also suggested improvements to the CCTV cameras and touched on pressing issues facing their poorly resourced control centre vis-à-vis other control centres.

> *Honestly, we will be happy if the response time is improved from Metro Police and SAPS. We are tired of complaining every day about the same thing. Maybe they can hire a security company dedicated to responding to our queries here in Centre 3. (Participant A: Centre 3).*

Each centre had its unique challenges, and operators provided suggestions on what must be done. The ongoing technical problems sometimes made operators raise concerns and suggest measures for improvement, hoping that their grievances and improvement suggestions will be significant to improve the current surveillance systems. Consider the following.

> *Here in the city, some cameras are installed at a wrong place, and the level of cameras linkage is poor, and we struggle a lot. There is a need for cameras for linkage in CBD, and we also need more cameras...- even some cameras must be placed on a level building where I can see everything. Also, the city must do more to repair broken cameras and other things such as consol. (Participant B: Centre 1).*

The majority of operators offered substantial insights on enhancing the existing CCTV camera systems within the city. Despite their firsthand experience and expertise in operating CCTV systems, there is not much scope for CCTV operators to make input into decision-making in the realm of surveillance improvement. Based on my interactions with operators, it became apparent that they felt that their concerns regarding operational issues related to CCTV cameras are often disregarded despite the significant negative implications for their usefulness and efficacy. The issues of faulty equipment and the availability of working tools and resources have been longstanding concerns. Moreover, one of the findings was that the majority of operators saw themselves primarily as employees rather than as individuals responsible for proposing and providing management with ideas and plans for enhancing the efficacy of CCTV camera systems. Consequently, they did not see any need to suggest/ offer ideas on improving the current CCTV systems for the betterment of operations.

4.6 Chapter summary

Chapter four provided findings of the main research, which was to understand CCTV operators' tasks in contributing to efficient crime prevention. The results demonstrate two things. First, they understood their role as that of observing and identifying any suspicious behaviour and then reporting to the relevant authorities, such as the police and other law enforcement. Secondly, while they understood their role in observing and detecting criminal behaviour, they identified several challenges that impacted negatively on the use of technology. Operators are intimately dependent on the police to respond to their reports of incidents. Without the capacity and willingness of the SAPS to respond, monitoring and detection on the part of operators will not yield the desired effect. To counter this problem, most of the participants suggested socio-technical solutions to the challenges.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This study focused on a number of research questions. In answering the research question: *What is the role of CCTV operators in contributing to efficient crime prevention*? The dominant narrative that emerged in response to the question was that most CCTV operators from all three centres understood their role as monitoring criminality and keeping communities safe. Participants spoke about the need for situational awareness, knowing the area covered by CCTV cameras, being street-smart, observant, and reacting quickly to suspicious-looking activity. Operators were further of the opinion that CCTV cameras had to be monitored round the clock to yield crime reduction effects. Most CCTV operators indicated how they use types of equipment and other technological items such as keyboards, computer interfaces, and joysticks to move and control cameras remotely while they are monitoring for any suspicious behaviour.

At the heart of operating CCTV cameras, technology is the link between the equipment (i.e., cameras) and the individual operator. Furthermore, operators indicated that CCTV cameras function as a tool to prevent and reduce crime by recording evidence that can be used in a court of law for prosecution. Moreover, they are sometimes requested to be witnesses and testify in a court of law for certain cases. The operator who sits behind the CCTV system is a key cog in the machine aimed at effective and efficient surveillance. Thus, being vigilant and thorough in the detection and recording of incidents were considered key to the occupational responsibilities of operators. Data captured in the research further indicates that operators fulfil various responsibilities. This may range from operating and monitoring various screens, reporting suspicious activities and incidences of law-breaking, as well as contacting other law enforcement agencies and emergency services when required.

Regarding inter-agency cooperation, the newly established (EPIC), (Emergency Police Incident Control) enabled operators to log calls to any of the law enforcement agencies within the city, excluding the South African Police Service. SAPS was typically reached by a two-way radio system facilitated by a police officer assigned to each closed-circuit television

(CCTV) centre. However, it is worth noting that Centre 3 Centre did not have a police officer assigned to it to escalate alleged offences and the communications and collaborations between operators and SAPS are not looking good. This is caused by various factors between the city safety structures and SAPS. Eleven participants indicated that their relationship with SAPS was productive. Four participants, however, expressed concerns about the working relationship. Poor response time on the part of SAPS to incidences recorded by operators was a dominant concern. They further indicated that organisational arrangements to respond timeously to reported incidents were lacking – particularly at the Centre 3.

With regards to the occupational challenges faced by participants from all CCTV control centres, challenges such as faulty equipment, load-shedding, cameras going offline in crime hotspots, cable theft, vandalism, delays in the maintenance of faulty camera systems, trees obstructing camera vision, and lack of response from law enforcement were all mentioned. Of the many challenges identified, faulty cameras and load-shedding were considered the most prominent. Various participants believed that the crime prevention initiatives of the city would only flourish if recurring problems were adequately addressed. They also stated that their voices have no influence in decision-making regarding any improvement of CCVT cameras.

Interviewees were also asked about the effectiveness of CCTV cameras in preventing crime. Most operators indicated that CCTV cameras could have a positive impact on the reduction and prevention of crime. Proof of such impact was the incidents captured on live CCTV cameras and the arrests that followed. Several participants, however, had mixed opinions regarding the prevention and reduction of crime in Cape Town. They stated that Cape Town communities remain trapped in a cycle of daily crime. For them, CCTV cameras only had a marginal impact on the overall crime rates of the city. In contrast, City authorities had a more positive view of CCTV systems. The control and preventive function of such systems justified investment in CCTV cameras for crime prevention purposes is not justified. This view was challenged by a safety specialist interviewed. From such responses, we conclude that the crime prevention dividends of surveillance systems remain mired in controversy.

In summary, this research study examined the views and experiences of CCTV operators operative in three control rooms of the City of Cape Town in facilitating effective crime prevention. To the best of the author's knowledge, this study represents the first, albeit modest, research endeavour in South Africa that specifically examined the views and experiences of surveillance operators. In the section below, the broad conclusions of the study are articulated

before turning to a number of recommendations for improving the impact of operator surveillance.

The role of human operators

CCTV operators have largely been neglected in studies of surveillance systems. Human involvement in the surveillance ecosystem is of importance. Artificial intelligence has taken centre stage in various forms globally; be that as it may, the implementation of these technologies for both public and private security necessitates human intervention. Operators do not only operate cameras, but they are also engaged in other tasks related to their job description. The indispensable role of CCTV operators in exercising judgement, making decisions, and maintaining vigilance requires more investigation. Operators undergo some training before assuming their roles. Such training, however, is not comprehensive. Furthermore, different security organizations in South Africa have different recruitment strategies and training systems.

Application of technology and challenges

The integration of technology within surveillance ecosystems is a feature of the current era. The utilisation of technology in surveillance environments remains a formidable challenge, as several control rooms encounter difficulties in assimilating it into their existing systems. It is widely acknowledged that technology has exerted a significant impact on the globallandscape of policing, manifesting in various forms, such as the widespread adoption of closed- circuit television (CCTV) cameras, drones, and the integration of artificial intelligence (AI) systems. Although it is acknowledged that digital policing is an integral component of the surveillance ecosystem, it is important to note that the existing subsystems confront persistent technical issues. These malfunctions have a detrimental effect on the efficiency of policing systems, making it challenging for operators to perform their duties effectively and maximise their crime prevention outputs.

Ethical practises, professionalism, and privacy

The ethical practices inside a surveillance environment are a significant concern among operators. While CCTV operators are typically educated about ethical practices, they frequently fail to apply this knowledge, resulting in the violation of human rights for those being observed. The author posits that there is a need for enhanced training for CCTV operators

to ensure ethical monitoring practices within the public sphere. Unethical practices in some cases may amount to the inadmissibility of recorded evidence in a court of law. Managers claim that operators are trained in ethics, and operators speak about the ethical dilemmas they often confront. The author emphasises the importance of thorough training for operators in order to develop a heightened awareness of ethical practices.

Collaboration of various law enforcement agencies and CCTV operators

To optimise effectiveness and fulfil the objectives of crime prevention, a partnership between law enforcement agencies, particularly the police, and closed-circuit television (CCTV) operators is critical. The perpetuation of criminality across communities can be attributed to poor coordination, which indirectly stems from variations in policing systems, mutual trust, and their lack of common aims. Enhancements in collaborations have the potential to yield substantial transformations and enhance the existing partnership. Nevertheless, it is yet to be determined whether the ongoing public dispute, which needs immediate attention, will be addressed in the near future.

Crime prevention of CCTV cameras and CCTV operators' view

Technology has become an essential factor in addressing criminal behaviour. Across the globe, there has been rapid usage of Closed-Circuit Television (CCTV), including in big metropolitan areas in South Africa. What is behind the installation and use of surveillance systems is the widespread belief that CCTV cameras are effective in preventing and reducing crime if it is used appropriately. Despite the contestations regarding impact, there has been a rapid expansion of the usage of CCTV surveillance for security purposes in South Africa, with the City of Cape Town investing millions in surveillance systems. The author posits that CCTV cameras do not serve as an effective deterrent for criminal activity; rather, they may create a perception of security among individuals utilising public areas. The effective operation of closed-circuit television (CCTV) cameras necessitates the presence of a well-equipped and adequately resourced law enforcement agency complemented by a proactive response team on the ground. One notable aspect of this study was the observation that even operators expressed doubts regarding the crime-prevention efficacy of CCTV systems. Malfunctioning systems, it would seem, contribute to a lack of trust in the systems.

In conclusion, this study highlights the essential significance of CCTV operators in upholding the safety and security of the public at large. Operators deserve proper training, resource support, functioning surveillance systems and ethical guidance for optimal performance.

As the surveillance ecosystem is evolving, the role of CCTV operators and good practice seems to be an indispensable asset in our pursuit of a safer and more secure global environment. The human impact in the operations of CCTV cameras remains irreplaceable for safety and security. In a quest to enhance the effectiveness of the implementation of CCTV video surveillance systems as a means of situational crime prevention and reduction, the author presents the following recommendations.

5.2 Recommendations on CCTV operators

- In improving the role of CCTV operators' cameras, better and smarter use of technology is required. It is imperative that the equipment be properly maintained and suitably adjusted to accommodate evolving workloads. This will assist operators in keeping up with tech usage for crime prevention purposes.
- Proper training in digital policing is required for CCTV operators to keep up with technology in policing. Security companies should move with the time to prepare their operators for technology involving artificial intelligence and drones for policing purposes.
- Supervisors and managers should support an initiative-taking workforce through staff appraisal, promotions, improved working conditions and recognition of good performance.
- There is a need for thorough research on CCTV control room settings to fully examine factors that can increase the detection and vigilance capacity of operators. The technical side of the operations of surveillance requires more research as technical challenges are linked with poor detection by CCTV operators.
- More research is required to consider the settings of current CCTV control rooms. Such research should cover issues such as overall working conditions, staff appraisal systems, the health implications of CCTV operators for long hours staring at screens, and security provided to operators who testify in courts of law.
- CCTV operators must be offered an opportunity to network more widely with operators nationally and globally to exchange methods of best practice.

- National policy should be developed on how best operators can balance public safety and security and the protection of human rights, specifically the right to privacy and compliance with the Protection of Personal Information Act (POPI Act of 2013). Through the researcher's observation during data collection, I noticed that there was little knowledge about the POPI Act of 2013 and the protection of the right to privacy.
- The security sector ought to initiate discussions concerning the ramifications of artificial intelligence (AI) cameras and their potential effects on the job security of operators. In addition, it is crucial to devise strategic approaches to mitigate adverse implications.

5.3 Recommendations for addressing challenges

5.3.1 Maintenance

- Based on suggestions made by operators, the maintenance team's turnaround time should be improved in fixing CCTV cameras.
- Regular maintenance should be prioritised to ensure that cameras are fully functioning. This maintenance should also include both internal and external technical aspects of CCTV cameras.

5.3.2 Power cuts and Cable theft

- To offset the impact of power outages, there is a need for investment in power generators, including solar power panels, to ensure that cameras do not switch off and camera screens switch on automatically.
- Installation of hidden CCTV cameras, which can play a crucial role in detecting sabotage or vandalism of the cables, should be considered.

5.3.3 Law enforcement collaborations

- There is a need for drafting a binding collaboration framework with various law enforcement agencies to strengthen cooperation and hold each other accountable.
- There must be a strengthened management of working relationships between police and other stakeholders within the communities.

- The planning and implementation stages of CCTV cameras should include private and public community safety structures for improved collaborations. In addition, this will enhance information sharing regarding safety and security in the public space.

5.3.4 Equitable access to human resources

- Surveillance centres need equitable access to resources. The unevenness of resource allocation (as in the case of Centre 3) impacts negatively on performance and contributesto a feeling of alienation amongst staff.

5.3.5 Inadequate police response time

- Metropoles across South Africa, as the main users of CCTV cameras for public safety, should consider the deployment of a dedicated team of police with a specific focus on responding to crimes reported by operators. The reporting of these crimes would take place via the EPIC system, which would be accessible to each of the law enforcement officers, as is the case currently within the City of Cape Town.

- A concerted effort should be made to increase police response time to incidents reported by operators. With average police response time reported to be poor, there is a need to strengthen collaboration and share the challenges and success of the police response time. This can be done through monthly meetings with various law enforcement agencies. The aim would be to mitigate areas of challenges and develop working strategies to improve police response time.

5.4 Future Research studies

I further recommend that future research studies be conducted focusing on other technical factors which affect the performance and limit the effectiveness of CCTV cameras. Even though several occupational challenges were identified, more in-depth research is required. Future studies should look at aspects such as operator performance and operator processes, attention process, staff morale, working conditions, staff remuneration and operator vigilance levels.

With technology becoming part of our lives, more research should be conducted on policing through artificial intelligence and how this will impact the role and function of CCTV operators.

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APPENDICES

Appendix A: Interviews questions

Closed Circuit Television Surveillance Operators

Research Project Tittle:

Research Title: The role and impact of CCTV operators in contributing to efficient crime prevention: A case study of surveillance operators within the City of Cape Town.

Section A: Questions about the role, functions of the CCTV operators

1. What is the role/ function played by CCTV surveillance operators in charge of CCTVs?
2. How long have been you employed as a CCTV operator?
3. How do CCTV operators understand their work as security personnel in contributing to efficient crime prevention?
4. What are the challenges if any are related to everyday CCTV control room operations? Explain what happens technical glitches occur.
5. Are the cameras being always watched carefully and effectively? If yes, why and if not why?
6. What are the operational protocols implemented in the CCTV Surveillance Control Room? Please provide a detailed description.
7. What does a surveillance operator's day-to-day routine entail?
8. What kind of analysis of crime data is undertaken?
9. What are the operators' thoughts on the cameras?
10. How might CCTV systems be improved?

Section B: Questions about surveillance operator's work requirements

1. What are the skill requirements for surveillance operators?

2. Is there any in-house training and skilling available?

3. What are the key features of the surveillance operator's job and responsibilities?

4. What are some of the most important characteristics of a good CCTV surveillance operator?

Questions to probe Operator's views relating to CCTV systems and crime detection and prevention.

1. In your opinion, do you think CCTV surveillances do prevent and control crime? If yes, why and if no why
2. How are the CCTV control rooms linked to other law enforcement and community safety systems? Such as the SAPS and private security companies
3. What is your view on inter-collaboration with SAPS?
4. What are the challenges that surveillance operators face on a daily basis?
5. On a scale of 1 to 5, how would they rate your job satisfaction as CCTV operator?
6. Do you believe the CCTV surveillance system has helped to reduce crime in the CBD?

Appendix B: Research consent form

Consent Form

Dear Prospective Participant

My name is Phelimon Papale, I am a student at University of Cape. I am currently studying towards a master's degree in criminology, Law, and Society in the Faculty of Law. I am conducting research on:The role, function, and impact of CCTV operators' crime prevention: A case study of surveillance operators within the City of Cape Town.

I am conducting this research project to explore and understand the role and impact played by CCTV operators in their work environment. There is an increasing body of research on the use of technology in crime control and crime prevention. More recently research on CCTV systems and their impact on crime has emerged. However, little is known about the people who operate CCTV cameras. What exactly is the duty of the CCTV surveillance operators in charge of these surveillance systems and what are their views and experiences relating to their duties? This research wishes to explore the views and experiences of the operators of CCTV surveillance systems.

You have been identified as a suitable participant given your work and experience in

the field. I intend to interview 15 CCTV surveillance operators in control rooms.

This research has been approved by the Faculty of Law and Research Committee at the University of Cape Town Ethics- Reference Number 2022_ L0201. You will be asked to provide informed consent before answering any questions or taking part in any tasks. Your participation in this research is voluntary. If you choose not to take part in this research, you will not be affected in any way whatsoever.If you agree to participate you can stop at any time and discontinue your participation without being prejudiced in any way. However, I would be grateful if you would assist me by allowing me to interviewyou.

Your participation in this research study will be via a one-on-one semi-structured interview. Each interview with participants will last for about 30 to 40 minutes and the researcher will

try to minimise the impact of such interviews on the work responsibilities of the operators. The interview will be held at a time and venue of your choice. The interview will be voice recorded (with the participant's permission) and notes will be taken during the interview. The recording will only be utilised by the researcher and will not be shared with others.

All information provided by you will be regarded as confidential. The researcher will not disclose any participant's name or contact details unless permission to do is provided by participant.

Confidentiality will be upheld by the utilisation of pseudonyms assigned to each participant. Throughout the data analysis and reporting, individuals will be referred to exclusively by their respective pseudonyms. The information received from any participant/interviewee will be electronically stored and be password protected. No one else besides the primary researcher and the designated supervisor of the study will have access to the research data. The research data will be destroyed once the project is successfully completed.

No monetary payment, inducements, or incentives will be offered for your participation in this study. Itis hoped that participants will benefit from the recommendations of the research where the researcher would provide recommendations for the adoption of best practice model for the use of CCTV in combating and detecting anti-social behavior.

The researcher does not foresee any negative consequences to you personally in participating in this research study or risk of harm that may result from the issues probed in the interview.

If you would like to be informed of the final research findings, please contact Mr Phelimon Papale oncell: 0812448307. The findings will also be accessible in the submitted final dissertation stored electronically in the University of Cape Town Library database of all University of Cape dissertations and theses.

In light of the COVID-19 pandemic, social distancing, mask wearing and sanitizing of hands will be practiced with a barrier separating the researcher and participant in the room.

'If you have concerns about the research, its risks and benefits or about your rights as a research participant in this study, you may contact the Law Faculty Research Ethics Committee Administrator, Ms. Lamize Viljoen, at +27 (0) 21 650 3080 or at

lamize.viljoen@uct.ac.za. Alternatively, you may write to the Law Faculty Research Ethics Committee Administrator, Room 6.29, Kramer Law Building,Law Faculty, UCT, Private Bag, Rondebosch 7701.

Consent

I hereby agree to participate in the research regarding: The role, function, and impact of CCTV operatorsin crime prevention. I understand that I am participating freely without being forced in any way to do so. I also understand that I can stop this interview at any point should I not want to continue, and that this decision will not in any way affect me negatively. The purpose of the study has been explained to me and I understand what is expected of my participation. I understand that this is a research project whose purpose is not to necessarily benefit me personally.

I have received the contact details should I need to speak about any issues that may arise in this interview. I understand that this consent form will not be linked to the questionnaire and that my identitywill remain confidential.

In addition to the above, I hereby agree to the audio recording of this interview for the purpose of datacapture. It is my understanding that no personally identifying information or recordings will be releasedin any form. I understand that these recordings will be kept securely and will be destroyed/erased oncedata capture and analysis have been completed.

Do you consent to audio recording of this interview for the purpose of data capture?

Yes		No	

_____ _____

Signature of Participant Date:

Appendix C: Research Approval letter City of Cape Town

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Date	: 08 April 2022
To	: Director: Policy & Strategy
Reference	: PSRR- 0442

Research Approval Request

In terms of the City of Cape Town System of Delegations (March 2022) - Part 13, No 3 Subsections 4, 5 and 6

"Research:

(4) To consider any request for the commissioning of an organizational wide research report in the City and to approve or refuse such a request.

(5) To grant authority to external parties that wish to conduct research within the City of Cape Town and/or publish the results thereof.

(6) To after consultation with the relevant Executive Director: grant permission to employees of the City of Cape Town to conduct research, surveys etc. related to their studies, within the relevant directorate

The Director: Policy & Strategy is hereby requested to consider, in terms of sub-section 5, the request received from

Name	: Phelimon Papale
Designation	:Master's candidate
Affiliation	:University of Cape Town
Research Title	: "Therole, function, and impact of CCTV operators in contributing to efficient crime prevention: A case of study of surveillance operators within the City of Cape"

Taking into account the recommendations below (see Annexure for detailed review):

Recommendations

That the CCT via the Director: Policy & Strategy grants permission to Phelimon Papale, in his capacity as a Master's candidate in Criminal Law at the University of Cape Town, to conduct research subject to the following conditions:

- All National, Provincial and CCT COVID-19 pandemic response requirements are to be adhered to at all times in the implementation of the research project;
- Where face-to-face research engagement is inevitable, social distancing to be maintained at all times, and protective gear to be worn and used continuously during face-to-face engagements;
- The researcher is to make contact with Barry Schuller (Barry.Schuller@capetown.gov.za) for the data collection session and observation of the CCTV control rooms, as well as guidance on the communication and operations and observation protocols in CCT control rooms, before the research on the City of Cape Town commences.
- At no stage should the researcher impact on or interfere with the operations of the CCT control rooms or staff in any way, with the exception of agreed and scheduled interviews.
- A maximum of 15 CCTV operators to be surveyed for a maximum of 3 hours of observation a day (week days only), and only for 3 days (subject to Securitas Security Services' approval, refer below)
- Interviews with CCTV operators to conclude within three days of the first interview, on condition of approval by the contractor, Securitas Security Services to interview operators who meet the

selection criteria of 4 to 5 years of experience as CCTV operators;

- Participation of Securitas Security Services staff may be subject to approval, resource and staff availability, and the willingness of individual staff members to participate in the research study, in a voluntary capacity;
- Clear acknowledgement in the research report that the views of the research participants are not regarded as CCT policy;
- Securitas Security Services officials and their inputs to be anonymised and the conditions of anonymity be adhered to in the research report;

CIVIC CENTRE **IZIKO LEENKONZO ZOLUNTU** **BURGERSENTRUM**
12 HERTZOG BOULEVARD CAPE TOWN 8001 PRIVATE BAG X9181 CAPE TOWN 8000
www.capetown.gov.za

Making progress possible. Together

- Due to the operational nature of the site, the researcher is not permitted to access the site without prior approval from the Metropolitan Police Chief, and must be accompanied by a City official or other relevant (e.g. Securitas Security Services staff) at all times; as relevant;
- In the event of access to a City facility or that of a City contractor, the City is indemnified against any damage, loss, or injury that the researcher may experience
- Approval is provided for use of City contractor Inputs for this research report only, and any future publications, presentations and articles requires supplementary approval;
- The City branding and logo are not being used in the research report;
- The research data and research findings to be shared with participating CCT Metro Police Departments, in either a findings report or presentation, as requested;
- Submission of the completed research report to the Director: CCTV and Radio, Metropolitan Police Services; the Director: Policy & Strategy and the Manager: Research Branch, Policy & Strategy, within 3 months of completion of the research report.

	Delegated authority:	**Acceptance by Applicant:**
Approved	subject to above conditions	I, Phelimon Papale ..... ,
Comment:	_____	
Not Approved	Comment:	confirm that I agree to abide by the conditions as stipulated above.
	_____	_____

Appendix D: University of Cape Town Ethical clearance, Research Ethics Committee

Faculty of Law: Research Ethics Committee

Private Bag X3 ▪ Rondebosch ▪ 7701 ▪ South Africa
Room 6.29 ▪ Kramer Building ▪ Middle Campus
Tel: +27 021 650 3080 Fax: +27 021 650 5660
E-mail: lamize.viljoen@uct.ac.za Internet: www.law.uct.ac.za

Certificate of Approval for Ethical Clearance

PRINCIPAL INVESTIGATOR/SUPERVISOR: ELRENA VAN DER SPUY STUDENT: PHELIMON PAPALE NNKUNA – **[PPLPHE001]** FACULTY: LAW DEPARTMENT: PUBLIC LAW	**ETHICS REFERENCE NUMBER: L0201-2022** ORIGINAL APPROVAL DATE: 19-APRIL-2022 APPROVAL EXPIRY DATE: 18-APRIL-2023

PROJECT TITLE: The role, function, and impact of CCTV operators in contributing to efficient crime prevention: A case study of surveillance operators within the City of Cape Town.

PURPOSE OF RESEARCH: The proposed research aims to investigate, describe and analyse the routine activities undertaken by CCTV operators attached to surveillance monitoring systems in the City of Cape Town. The research will investigate occupational responsibilities and operational strategies as well as their views and experiences.

CONDITIONS OF APPROVAL

This Certificate of Approval is valid for the above term provided there is no change in the protocol.

Modifications
To make any changes to the approved research procedures in your study, please submit a formal "Request for a Modification" to the REC Administrative Office. You must receive ethics approval before proceeding with your modified protocol.

Renewals
Your ethics approval must be current for the period during which you are recruiting participants or collecting data. To renew your protocol, please submit a "Request for Renewal" form before the expiry date on your certificate. You are responsible for submitting this by at least 2 months prior to the expiry date of clearance date issued.

Project Closures
When you have completed all data collection activities and will have no further contact with participants, please formally notify the REC: Law as well as your supervisor where applicable.

Certification

This certifies that the University of Cape Town Law Faculty's Research Ethics Committee has examined this research protocol and concluded that, in all respects, the proposed research meets the appropriate standards of ethics as outlined by the University of Cape Town Research Regulations Involving Human Participants.

Signed by candidate

Dr Nomfundo Ramalekana
LAW REC: LEAD REVIEWER

Certificate Issued On: 25/04/2022