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Analysing the Role of Data Integrity in Crime Analysis and Prevention within the South African Police Service

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Abstract: Information management plays a crucial role across various sectors, particularly within police departments, where the ability to collect, process, and analyse data is fundamental for informed decision making and strategic planning. In response to this need, the South African Police Service (SAPS) has partnered with Statistics SA to ensure that crime data meet high-quality standards, thereby enhancing the reliability and accuracy of crime analysis. This paper analyses the role of data integrity in crime analysis and prevention within the SAPS, emphasising the importance of maintaining high-quality data to support effective policing. Using a qualitative approach, the researchers collected data through an extensive literature review and in-depth interviews with SAPS officials, Crime Information Management and Analysis Centre members at the station level, and Crime Registrar members at the provincial and national levels. Insights from two international participants provided a global perspective on the use of crime analysis units in crime prevention and reduction. The findings reveal that while crime analysis is essential for supporting police operations, poor-quality data hamper decision making and resource allocation and lead to inefficient police responses. The paper highlights the benefits of high-quality data and underscores the critical role of crime analysts, which utilises primary and secondary data to derive insights that guide police operations. Recommendations include the need for comprehensive training for stakeholders on the various types and processes of crime analysis. The researchers also advocate integrating crime analysis into daily operations, strategic planning, and decision making, to ensure better coordination and information sharing across units. The SAPS should implement robust monitoring mechanisms to ensure effective and efficient data capturing across all internal systems. Personnel responsible for entering data into police systems and case dockets must be held accountable when data are incomplete, inaccurate, or not captured according to standards. Since crime analysis is dependent on the integrity of the data input, the SAPS should prioritise developing and implementing a clear consequence management framework. It can enhance its crime prevention efforts by improving data integrity, fostering collaboration, and implementing the proposed strategies to safeguard communities. A structured approach to crime analysis will enable the SAPS to optimise its effectiveness in crime reduction, offender apprehension and resource management.

Keywords: Crime analysis, Crime Information Management and Analysis Centre, crime prevention, data analysis, data integrity, data management, data quality, information management, South African Police Service

Introduction

Effective information and data management are indispensable for modern policing, particularly in the areas of crime analysis and prevention. Within the South African Police Service (SAPS), the ability to collect, process, analyse and utilise crime-related data is fundamental to transforming raw information into actionable intelligence. This process enables more informed decision making, proactive policing, and targeted crime-prevention strategies. To ensure the quality and reliability of such data, the SAPS has entered into a strategic partnership with Statistics South Africa (hereafter Stats SA). This collaboration ensures that crime statistics adhere to the South African Statistical Quality Assessment Framework (SASQAF), thereby enhancing the integrity and credibility of crime data used for analysis (SAPS, 2017a:14; Stats SA, 2011:2).

Data integrity plays a critical role in ensuring that crime analysis produces reliable insights to support the prevention, reduction, and detection of crime. Poor-quality data can distort analysis, lead to ineffective strategies being adopted, and ultimately undermine the operational goals of policing. According to Santos (2017:142–143), essential dimensions such as timeliness, reliability, validity, and data confidentiality all contribute to the overall integrity of crime data. Similarly, Bruce (2004:24) emphasises the need for accuracy, completeness, and the timely processing of data to enable effective utilisation by analysts. Without a robust data integrity framework, even the most advanced analytical tools may yield misleading conclusions.

The significance of accurate crime analysis is underscored by the frequency and severity of the crimes reported in South Africa. As Govender (2013:49) notes, consistent media coverage of violent crimes has made crime a persistent public concern. This has reinforced the constitutional mandate of the SAPS, as articulated in Section 205(3) of the Constitution of the Republic of South Africa (Act 108 of 1996) (RSA, 1996), which prioritises the prevention, combating, and investigation of crime. Analysing the who, what, when, where, why and how of criminal incidents is fundamental to developing effective responses (Brown, Esbensen & Geis, 2010:99). Crime analysis, as a professional practice, facilitates this by using data to generate insight into patterns, trends and emerging threats. Goldstein (2005:397) argues that examining the nature of crime is the most effective way of addressing underlying criminal problems, while Walker and Drawe (2018:2) define crime analysis as the study of criminal activity, intended to inform the apprehension of offenders and enhance crime prevention efforts. By identifying patterns, analysts help to develop strategies that can anticipate and prevent future crime occurrences (Brown et al., 2010:99). For Osborne and Wernicke (2003:4–5) and Horne (2009:70–71), crime analysis supports law enforcement by detecting crime trends, supporting inter-agency collaboration and fulfilling the need for informed policing in a dynamic environment.

The SAPS has established a dedicated crime analysis component that supports its crime prevention strategies. Although crime analysis alone does not directly reduce crime, it enhances the effectiveness of police actions when used strategically. Santos (2014:174) likens crime analysis to medical magnetic resonance imaging (MRI), which provides a diagnosis and guides treatment, but is not a cure in itself. As such, crime analysis must be integrated into operational strategies to realise its full benefit in combating crime. The development of crime analysis in South Africa has seen the successful piloting of crime mapping and analysis tools, notably through the Council for Scientific and Industrial Research (CSIR), which has supported improved understanding and targeted interventions by police officers (Hansgen, 2016:7; Stylianides, 2010:8). To ensure that crime data are accurate and usable, the SAPS has implemented internal quality assurance mechanisms, such as the Provincial Quality Assurance Section. This unit is responsible for checking the completeness and correctness of crime data at the station level, underscoring the importance the SAPS places on data integrity (SAPS, 2017a:12).

Historically, crime analysis has existed in both informal and formal forms. Informal crime analysis based on individual memory and subjective judgement was prone to bias and inaccuracy (Buck, Austin, Cooper, Gagnon, Hodges, Martensen & O'Neal, 1973:3; Bruce, 2017a:4). In contrast, formal crime analysis introduces objectivity, coordinated data handling and systematic pattern identification, granting more timely and comprehensive insights into criminal activity (Buck et al., 1973:4; Piza & Feng, 2017:340). In response to the growing importance of formal crime analysis, police departments worldwide – the SAPS included – are increasingly integrating these practices into their everyday operations (IACA, 2014:1).

This study adopted a qualitative case study design to explore and critically examine how data integrity influences crime analysis processes and crime prevention within the SAPS. The paper outlines the evolution, practices, and operational implications of crime analysis, with a particular focus on the systems, challenges, and opportunities associated with ensuring data integrity in support of effective policing.

Literature Review

An overview of crime information management

Information plays a critical role in all spheres of life, and its effective management is indispensable. Individuals and organisations alike depend on their capacity to collect, process and analyse information, to understand their immediate environments and broader contexts. Information management supports essential activities such as learning, development, strategic planning, and (most significantly) analysis and decision making (Management Extra, 2005:xiii). Within law enforcement, the ability to manage crime-related information accurately and efficiently is vital for effective policing outcomes. Police departments employ various tools, systems, and technologies to facilitate the collection, storage, and processing of crime data (Santos, 2017:111).

As Poblete (2013:14) outlines, crime information management encompasses three core components: first, it involves the collection and processing of information to populate databases – structured matrices designed for the searching, retrieval, and analysis of data through computerised systems (Santos, 2017:111). Second, it requires systematic activities aimed at monitoring, storing and retrieving the data generated, received or maintained by police organisations in the course of their operational duties (Poblete, 2013:14). Lastly, it necessitates a logical and methodological approach to data processing, enabling problem solving and informed decision making in the pursuit of crime reduction and the resolution of security challenges (Poblete, 2013:14).

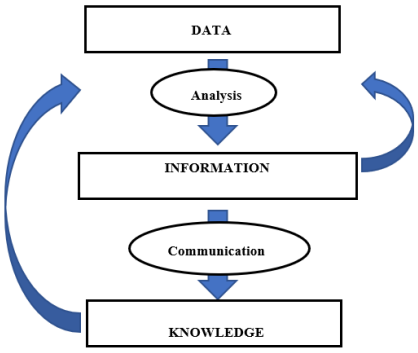
At its core, information management in policing involves organising and maintaining crime records and data as a foundational step in crime analysis. This necessitates a robust data management infrastructure, accompanied by reliable information and institutional knowledge, to optimise the organisation's operational and analytical capabilities (Poblete, 2013:17). 'Data', in this context, refers to systematically collected facts derived from observation, experience or experimentation, that can be used to generate insights. Ratcliffe (2016:70–74) and Santos (2017:111) describe data as raw, unprocessed observations or measurements that may include text, numerical values, or images, each representing variables such as crime type, time, date, and location (Santos, 2017:111). The process of transforming data into useful information and (eventually) actionable knowledge is a progressive one. According to Ratcliffe (2016:70–74), data become information once contextualised and infused with meaning. Once this information is further interpreted and synthesised with understanding, data evolves into knowledge. Thus, the transition from data to knowledge requires not only technical processing but also cognitive interpretation, which is essential for meaningful crime analysis and informed policing interventions.

Transforming data into knowledge

The transformation of data into knowledge is a critical process in crime analysis and policing. Data are the raw materials, gathered from various sources, which analysts process to generate information (Bruce, 2004:12; Bruce, 2017a:2). The information is then disseminated to crime analysis clients (typically law enforcement personnel) who interpret and internalise it. Once understood and contextualised, the information evolves into knowledge that informs strategic and operational decisions within the police service. Santos (2017:184) further explains that data only becomes information and knowledge when effectively communicated and analysed. In this regard, information is more than a set of facts; it becomes knowledge when it provides insight into specific circumstances or events, empowering decision-makers to act. Thus, the quality and clarity of communication, and of analytical interpretation, are central to this transformation process.

The outputs of crime information analysis often include detailed reports on specific incidents or aggregated data on crime patterns over defined time periods. These analytical results are primarily intended to present factual information, rather than draw conclusions about the causes or implications of those facts. As Santos (2017:184) notes, crime analysis outputs do not automatically dictate police responses. Instead, they serve as a foundation for law enforcement personnel to reflect on, evaluate, and then decide on appropriate actions. The transformation of data into actionable knowledge therefore relies not only on analytical techniques, but also on the ability of police decision-makers to interpret and apply the information meaningfully within their operational context. Figure 1 depicts the transformation of data into information and knowledge.

Figure 1: Transition from data to knowledge



Source: Bruce (2017a:2)

For the purposes of this paper, 'information' and 'data' are used interchangeably. However, it is important to recognise that their value depends on their fitness for purpose, that is, their relevance, accuracy and timeliness in a given context. As Management Extra (2005:2) cautions, data and information are only useful when they are available at the right time and in the appropriate format, and align with the specific needs of the user.

Factors influencing the quality of data

The SAPS has formalised its commitment to data quality by signing a memorandum of agreement (MoA) with Stats SA. This partnership aims to ensure that the crime statistics disseminated by the SAPS comply with the standards outlined in the South African Statistical Quality Assessment Framework (SASQAF) (SAPS, 2017a:14). SASQAF provides a national framework for assessing the quality of statistics intended for public use. According to Stats SA, data quality is defined in terms of 'fitness for use', and is measured against eight core dimensions: relevance, accuracy, timeliness, accessibility, interpretability, coherence, methodological soundness, and integrity (Stats SA, 2011:2; SAPS, 2019:5).

Several specific factors influence data integrity and, by extension, the effectiveness of crime analysis. These include the timeliness of the data, their reliability and validity, the processes used for data transfer, and the confidentiality of the information (Santos, 2017:142–143). Bruce (2004:24) and Santos (2017:142–143) emphasise that the accuracy, completeness, and consistency of data are critical elements that shape the quality of crime information and its usefulness to analysts. When these elements are compromised, the outcomes of crime analysis may be skewed or misleading, potentially affecting operational decision making and strategic planning within policing contexts.

Next, the researchers elaborate on some of these factors to illustrate how they collectively influence the integrity and utility of crime data within the SAPS.

Accuracy of information

The phrase "garbage in, garbage out" (Gigo) highlights a fundamental principle in data analysis; the accuracy of input data directly determines the reliability of analytical outcomes (Tshishonga, 2022:198). In the context of crime analysis, this means that inaccurate or poor-quality data will result in flawed or misleading outputs. Despite significant advances in analytical techniques and computing power, the effectiveness of these tools remains constrained by the quality of the data fed into the system (McCarthy & Ratcliffe, 2005:45). For crime analysis to be trustworthy, the data collected and entered must be precise and correct. Establishing robust processes to ensure this is thus critical. Edelstein, Faull and Arnott (2020:3) affirm that detailed and accurate information about the specific nature of crimes is essential for enabling the police to enhance public safety meaningfully.

Reliability

Reliability refers to the degree to which both the data and their source can be trusted (Tshishonga, 2022:199). Before using any dataset, analysts must assess the credibility of the source to ensure that the information provided is dependable (Bruce, 2004:24). According to the SAPS (2017a:19), evaluating the reliability of crime data involves scrutinising and verifying both the trustworthiness of the source and the consistency of the information itself.

Completeness

This involves assessing whether all relevant and necessary information has been included in the dataset (Tshishonga, 2022:199). Crime analysts must determine whether the data contain any missing fields, or whether key variables and facts have been omitted (Bruce, 2004:24). Incomplete datasets compromise the validity of analytical results. The SAPS (2017b:19) supports this view, noting that evaluating the completeness of information is essential for ensuring that no crucial variables are missing from crime reports.

Availability

Availability relates to the timeliness and accessibility of information (Tshishonga, 2022:199). It considers how promptly the data are made available, and whether the data are received in time to inform relevant decision-making processes. The relevance of crime data is closely tied to the timeliness and frequency of dissemination thereof (SAPS, 2017b:19; Stats SA, 2011:2). Bruce (2004:24) notes that data must reach the analyst while still current and actionable; delayed data reduces the ability to identify and respond to emerging crime trends. Schemerker, Wartell, and Weisser (2012:93) point out that crime analysis is often hindered by poor data integrity stemming from underreporting, missing variables, delayed reporting, data inconsistencies, and the use of overly broad crime categories. These deficiencies severely limit the utility of analytical outputs for informed police responses.

Bruce (2017b:123–124) emphasises that data serve as the fuel for all police analysis efforts. Poor-quality data contaminate the entire analytical process, leading to flawed insights and misguided decisions. Bruce (2017b:123–124) warns that the consequences of using bad data in crime analysis can be far-reaching and severe. Table 1 illustrates common types of poor-quality police data and outlines the implications for crime analysts.

Table 1: Bad data types in crime analysis: examples and consequences

Bad data type	Common examples	Consequences
Missing reports	Policy indicates that an officer should complete a full written report for an incident, but the officer does not, and it remains only a computer-aided design (CAD) record	Missed patterns and series; diminished understanding of trends, problems, hot-spots; inability to link known individuals to the offence
Fields not filled in	"Time From" and "Time To" fields left blank; offender characteristics like height and weight are skipped	Inability to accurately analyse crimes for appropriate characteristics; inability to find key records
Miscoded fields	Crime type entered wrong; incorrect property type code chosen	Incidents do not come up when conducting a search and are counted erroneously in strategic reports
Misspellings	Last name "PIEHL" entered into the system as "PEEL"; misspellings in street and city names	Inability to geocode/map data; inability to find key records
Duplication	The same incident was entered more than once; the same person entered more than once	Confusion in later searches; double-counting in strategic and administrative reports
Mismatch in fields	Street numbers too high for street name; 'aggravated assault' that indicates no weapon or serious injury	Inability to accurately analyse crimes for important factors

Source: Bruce (2017b:124)

Primary and secondary data sources

According to Bruce (2004:12), the value of a crime analyst's work lies in the quality of the information s/he generates, which is derived from both primary and secondary data sources. Secondary data refer to pre-existing information such as crime reports, arrest records, and call-for-service data. While analysts frequently use these sources, they often fail to address specific questions related to the underlying causes of crime, disorder, and other operational challenges. Consequently, analysts are sometimes required to gather primary data to fill in the gaps (Tshishonga, 2022:200).

Primary data are collected first-hand from people or places (Tshishonga, 2022:200), and include information obtained through interviews, focus groups, and surveys. In-depth interviews are commonly used to allow both the analyst and the participant to explore complex topics, clarify responses, and probe with follow-up questions. Focus groups, by contrast, are suitable when data need to be collected from a group of stakeholders (e.g., community members or police officers). Surveys are often employed when larger populations need to be reached, and when time and/or resources limit the feasibility of conducting individual interviews (Santos, 2017:128).

Primary data can also be collected through environmental surveys, scanning, and direct observation. Environmental surveys are systematic inspections of physical environments, assessing features such as lighting, parking availability and structural visibility (e.g., number of windows) (Tshishonga, 2022:200). Direct observation involves spending extended periods at a location to understand the social dynamics of the space, such as how it is used, who frequents it, and the nature of public congregation (Santos, 2017:128).

The choice between primary and secondary data collection depends on the purpose and scope of the crime analysis (Santos, 2017:128). As Edelstein et al. (2020:6) assert, crime analysis provides critical information that guides strategic police planning, but for such data to be useful, it must be accurate, complete, precise, and reliable, and the process must include effective data management to avoid compromising its quality.

Helms, Bair, Fritz, and Hick (2012:119–120) identify several common data management errors that can affect the integrity of both primary and secondary data:

- Record transaction errors occur when file systems or databases reject or delete information due to storage limitations.
- Field transaction errors happen when data fields are not configured to accommodate the input (e.g., text fields that are too short).
- Field conversion errors arise when data are transferred between systems and improperly formatted, such as a date field being misinterpreted as a numeric field.
- Physical data corruption refers to the loss or damage of physical records, such as misplaced handwritten reports that are never digitised.

To minimise such errors, maintaining a data chain of custody is essential. Helms et al. (2012:119 120) outline the ideal chain from the victim or offender to the records clerk, then the database administrator, and finally the crime analyst. If data integrity is compromised at any point, the overall analysis suffers. Despite best efforts, crime analysis often remains limited to summarising when and where reported crimes occur. This tends to lead to resource-intensive responses, such as increased patrols or surveillance, rather than strategic and proactive interventions that could be more effective in addressing the root causes of crime.

The applications/uses of crime analysis

The effectiveness of crime analysis is fundamentally dependent on how well police departments utilise the analytical products they produce. Crime analysis plays a pivotal role in proactive policing, and should form an integral part of every law enforcement organisation's operational strategy (Bruce, 2017a:27). As Horne (2009:71) explains, crime analysts are responsible for filtering vast amounts of data, removing irrelevant or unrelated information, and identifying data that can reveal the underlying facts of a criminal phenomenon. Once the analysis is complete, this information is disseminated to relevant operational and strategic police leaders, including detective commanders and client service commanders, to guide action (Tshishonga, 2022:204).

Following the analysis of information sourced from field reports, arrest records, and dispatch logs, the results are shared with key personnel such as line managers, supervisors, patrol managers, and field officers (Thibault, Lynch, McBride & Walsh, 2015:135). These insights enable managers to make informed, evidence-based decisions on member deployment and the development of appropriate patrol strategies. As Horne (2009:70) notes, crime analysis not only supports successful forensic investigations, it also contributes significantly to reducing crime and victimisation. Taylor, Boba and Egge (2013:5) support this, asserting that crime analysis underpins critical police functions such as patrol deployment, problem-solving, criminal investigations, prosecution and the assessment of policing strategies.

Crime analysis also allows police agencies to optimise their available resources, develop proactive crime prevention strategies, monitor performance, and make full use of the vast amounts of data collected internally and by partner agencies (Tshishonga, 2022:205). According to Cordner and Scarborough (2010:330–331), crime analysis supports decision making at the street level, aiding officers in deciding when and where to intervene, how to use uncommitted patrol time, and what tactics to apply. It provides police supervisors with a clearer understanding of crime and service demands in their areas, contributing to more effective planning and strategic responses (Tshishonga, 2022:205).

Moreover, patrol divisions frequently use the outputs of crime analysis to support coordinated patrol efforts, apprehend offenders, and develop focused crime prevention strategies (Ratcliffe, 2007:5; Santos & Taylor, 2013:506–507). Supervisors use this information to assign personnel efficiently and to guide the operational tactics of their subordinates (Cordner & Scarborough, 2010:329–331). Thibault et al. (2015:135) highlight that crime analysis is also

effective in workload analysis and can assist managers in deploying personnel based on need, rather than merely distributing resources equally.

At the strategic level, police administrators benefit from crime analysis when making decisions regarding resource allocation, tactical planning, and responses to external inquiries about crime trends. These data-driven insights are particularly valuable during budgeting and long-term planning processes (Cordner & Scarborough, 2010:329–331). Keeping police leadership informed of crime trends and patterns is critical for supporting the broader criminal justice system, particularly in the identification and apprehension of suspects, and the provision of evidentiary information (Horne, 2009:70–71). Crime analysis is therefore indispensable for both strategic and tactical policing, and for enabling investigators to effectively investigate, prevent, and reduce crime (Govender, 2011:121).

Geographic crime analysis is used to identify crime patterns, monitor offender movements, and motivate the deployment of patrol units to high-risk areas (Tshishonga, 2022:206). Spatial techniques such as hotspot mapping and temporal analysis allow analysts to pinpoint and prioritise crime-prone locations. By applying the principles of problem-oriented policing (POP), analysts can also assist in understanding crime drivers and recommend targeted interventions (IACA, 2018:6). Lum (2013:12–13) highlights the contribution of crime analysis to evidence-based policing by supporting the development of effective crime reduction policies and facilitating outcome evaluation to assess the impact of interventions.

To fully realise the benefits of crime analysis, police departments must ensure an adequate supply of, and demand for, analytical products. According to Matthies and Chiu (2014:7), analysts must tailor outputs to meet the needs of various police stakeholders – from frontline officers requiring weekly updates on local crime, to commanders seeking quarterly or annual overviews. Failure to recognise the strategic value of crime analysis may hinder its effective utilisation. For that reason, organisational leaders must actively promote its importance, cultivating a culture in which all members – from line officers to senior managers – value the role of crime analysts and high-quality data (Matthies & Chiu, 2014:7). Ultimately, the role of crime analysts and the application of their findings are critical to reducing, preventing and investigating crime. The timely and appropriate use of analysed information enables the police to respond more intelligently and effectively to crime trends, thereby enhancing community safety and supporting the broader goals of the criminal justice system (Horne, 2009:71).

Data integrity challenges in the SAPS

While crime analysis plays a pivotal role in enhancing policing efforts, its effectiveness is significantly hindered by persistent challenges, among which a lack of data integrity stands out. Crime analysis depends on the systematic processing of crime and disorder data to support evidence-based decision making. However, the accuracy, reliability, and validity of such data (collectively referred to as data integrity) are not always assured within the SAPS, and this ultimately compromises the outcomes of crime analysis (Poblete, 2013:16).

Crime analysis units within the SAPS draw data from a variety of internal and external sources. Internal sources include investigating officers, police records, communication systems, administrative divisions and special units, while external sources range from the Department of Correctional Services (DCS) to state records, courts, private organisations and other law-enforcement agencies (Palmiotto, 2013:16). According to Kempen (2019:11), data for analysis are primarily extracted from key SAPS systems such as the Crime Administration System (CAS), the Crime Management Information System (CMIS/SAPS 6), the Criminal Record Information Management System (CRIM), and the Global Access Control System (GACS), which includes geographic information system (GIS) functionalities and profiling tools. Additional information may be sourced from case docket analysis, profiling, crime scenes, fieldwork, environmental assessments, and interviews with suspects or witnesses (Tshishonga, 2022:183).

Despite the extensive data sources available, the quality of input data remains a substantial concern. As Edelstein and Arnott (2019:17) assert, the quality of any analysis is limited by the quality of the input data, given that flawed or incomplete data can render analytical outputs unreliable. This reinforces the view of Breetzke (2007:13), who states that poor-quality data undermine intelligence efforts, whereas high-quality data form the foundation of operational, strategic, and tactical planning. One of the most pressing issues is the questionable accuracy of crime statistics, often attributed to poor note-taking and ineffective data capturing on the CAS system. Accurate crime statistics are vital not only for crime analysis, but also for providing the public with a true reflection of crime trends at the national and local levels.

Burger, Gould, and Newham (2010:11) argue that inaccurate crime data pose a serious challenge to both analysts and police personnel who depend on the data to craft targeted crime reduction strategies. Breetzke (2007:14) identifies the root causes of such inaccuracies as stemming from substandard police work, incomplete or omitted docket

information, illegible statements, spelling errors, inaccurate recording of incidents and locations, inadequate supervision during data capture, and the flawed extraction and analysis of crime information. The broader implications of compromised data integrity are further explored by Berning and Masiloane (2012:87), who note that the lack of quality information in many police stations poses a serious risk to effective crime analysis. Van Graan and Van der Watt (2014:151) emphasise that data used in crime analysis must be accurate, relevant, timely, and reliable. As Govender (2011:127) reports, this ideal is not always achieved, with many SAPS departments collecting inconsistent types and levels of information. Some information is gathered systematically, but much is collected carelessly, further jeopardising the reliability of subsequent analyses (Breetzke, 2007:13).

To address this issue, there is a clear need for SAPS members to develop a better appreciation of data quality assurance procedures. As Breetzke (2007:13) suggests, awareness must be instilled among police officers regarding the significance of their roles in notetaking at crime scenes and in capturing accurate data on SAPS systems. Edelstein and Arnott (2019:5) argue that high-quality station-level crime data are essential for effective police surveillance, and must be closely monitored to enable adaptive policing based on emerging trends. For Govender (2011:112), without reliable and complete information, any crime analysis will inevitably be flawed and potentially misguide policing efforts.

Management inefficiencies further exacerbate data integrity challenges. According to the SAPS (2019:20), station commanders and CAS controllers or management of information (MIC) officials are tasked with ensuring regular data integrity checks. Sekhukhune (2017:7–10) explains that once a case docket is opened, it must be reviewed by the Community Service Centre (CSC) commander to verify its accurate capture in CAS. This includes confirming that all elements of the crime are correctly recorded, and that the narrative accurately reflects the circumstances of the incident. Moreover, the CSC commander must ensure that the SAPS 6 checklist columns are fully completed and must verify this through formal certification.

The station commander remains accountable for the correct registration and transfer of case dockets, and for ensuring that no crime is recorded solely in the occurrence book (OB). The SAPS (2017a:10) notes that the reliability of crime information directly affects operational deployment, the prioritisation of crime types, and the identification of hotspots. Accordingly, data quality checks by management are indispensable. Supervisors at all levels must take responsibility for the correct registration of crime, regardless of whether inaccuracies are intentional or within acceptable error margins (SAPS, 2017a:10).

Poor command-and-control structures, along with inconsistent consequence management, have been identified as key barriers to effective station-level data oversight (Burger, 2015:55). For Govender (2011:121), strong organisational command-and-control frameworks are essential to support the implementation of crime analysis strategies at the local level. Berning and Masiloane (2012:89) underscore that no workload pressures can justify the neglect of core managerial responsibilities such as command, control, and compliance monitoring.

Additional obstacles to effective crime analysis extend beyond data integrity. Santos (2017:32) and Poblete (2013:16) name several related challenges, including the inadequate availability of high-quality data, poor police information systems, limited analytical training, a lack of qualitative data use, ineffective feedback mechanisms and restricted communication between crime analysts across jurisdictions. The lack of formal training and published resources further compounds these problems, making it difficult for the SAPS to realise the full potential of crime analysis. The integrity of crime data underpins effective policing; without it, decision making falters, interventions miss targets and public safety suffers (Poblete, 2013:16; Santos, 2017:32).

Research Methodology

The researchers adopted a qualitative case study design to investigate the role of data integrity in crime analysis and prevention within the SAPS, with the aim of offering practical recommendations to enhance data integrity for more effective policing. The qualitative approach was grounded in the anti-positivist paradigm, which aligns with interpretivist traditions. This perspective is particularly appropriate for exploring the subjective meanings that individuals or groups attribute to social and organisational processes (Berg & Lune, 2012:3; Lune, Pumar & Koppel, 2010:80), allowing for an in-depth examination into the phenomenon under study.

Data were collected through in-depth, semi-structured interviews with a purposively selected sample of 48 participants. These included five individuals from the National and Provincial Crime Registrar (Sample A), 12 Crime Information Management and Analysis Centre (CIMAC) members (Sample B), seven station commanders (Sample C), nine Visible Policing (VISPOL) heads (Sample D), 13 detective commanders from the Tshwane policing district in Gauteng (Sample E), and two members of the International Association of Crime Analysts (IACA) (Sample F).

This diverse sample allowed for the collection of a wide range of perspectives on the challenges and practices related to data integrity in crime analysis.

A multi-method qualitative strategy was employed to analyse the data. Interview transcripts were supplemented by detailed field notes, which collectively formed the basis for thematic analysis. Initial coding and theme identification were followed by systematic categorisation, enabling the recognition of patterns, shared experiences, and key differences across participant responses. Thematic analysis allowed for the abstraction of broader meanings from the data, while content analysis was used to further classify and quantify recurring themes and characteristics (Anderson, 2014:240). These complementary methods supported the development of structured categories and facilitated comparative analysis across participant groups.

To ensure analytical depth and methodological rigour, convergent analysis was applied. This approach involved integrating insights from both the thematic and content analyses, thereby enhancing the reliability and robustness of the findings through triangulation. Triangulating the data-collection and -analysis methods not only strengthened the credibility of the research; it also afforded a comprehensive understanding of the issues at hand by incorporating multiple sources and viewpoints (Connelly, 2016:436). The final presentation of findings included the use of direct quotations to capture the participants' voices, as well as summary tables and narrative descriptions that synthesised the data into coherent analytical conclusions. These outputs reflected the lived experiences and professional insights of the participants, grounded in their respective operational and strategic roles within the SAPS.

Ethical approval for the study was obtained from the Research Ethics Committee (REC) of the University of South Africa (Unisa) (ref no. ST159). Permission to conduct the research was subsequently granted by the SAPS. All participants were fully informed of the study's objectives and procedures through detailed information sheets, and each provided written informed consent prior to participating. Confidentiality and anonymity were maintained throughout the research process, in accordance with ethical research standards.

Results and Discussions

Overview of crime information management

The literature review underscores that information is central to all functional systems and that the effective management of such information is crucial, especially in policing. As Management Extra (2005:xiii) asserts, information management underpins essential functions such as learning, development, planning, and (particularly) analysis. Within the SAPS, numerous tools and procedures are used to manage crime data effectively. According to Santos (2017:111) and Poblete (2013:14), police information management encompasses several key activities: the collection and processing of information to build comprehensive crime databases; the ongoing monitoring, storage and retrieval of data produced or received during police operations; and the logical, methodical analysis of the data to support problem solving and informed decision making aimed at reducing crime. A qualitative analysis of the participant responses in this study confirmed that these practices form the backbone of the SAPS's crime information management processes. Crime data, in essence, refers to organised sets of information derived from observation, experience, or reporting. When analysed, data becomes actionable information, and when effectively communicated, this information translates into knowledge (Santos, 2017:111; Ratcliffe, 2016:70–74; Bruce, 2004:12; Bruce, 2017a:2). Bruce (2004:12) further notes that the type and purpose of the analysis dictate whether primary or secondary data sources are used.

Within the SAPS, crime analysis is supported by an MoA with Stats SA, to ensure that crime statistics meet SASQAF standards. However, the literature consistently cautions that the utility of data hinges on the timeliness, accuracy and relevance thereof (Management Extra, 2005:2; Bruce, 2017a:2). Data available for analysis are often marred by incomplete fields, underreporting, delays, errors and overly broad classifications factors that significantly compromise analytical integrity (Breetzke, 2007:13; McCarthy & Ratcliffe, 2005:45; Schemerker, Wartell & Weisser, 2012:93). This concern was echoed by participants in the current study. As one detective from Sample E noted, *"sometimes we don't get accurate information from them."* Another participant commented, *"if properly utilised, we were supposed to be ahead of crime"*. The participants' responses furthermore indicated that while information systems exist, challenges such as inadequate staffing, delayed processing, and technological limitations hinder their optimal functioning.

Bruce (2017b:123–124) aptly describes data as the 'fuel' for crime analysis; with bad data contaminating the entire policing process. Consequently, data used for crime analysis must be accurate, consistent, complete and reliable (Helms et al., 2012:119–120). While some participants, particularly from samples C and D, believed that CIMAC offices functioned effectively, opinions varied by role and operational context. Station commanders from Sample C

generally expressed confidence in CIMAC's performance, with one participant noting, *"they provide information daily,"* while another said, *"they give us guidance and feedback at the Station Crime Combatting Forum (SCCF) meetings."* Additionally, a participant remarked, *"we are able to deploy resources according to the information received."* Similarly, VISPOL heads from Sample D shared positive views, stating, *"their information is always correct and effective during operations."* Another participant from this sample added, *"most of the successes that we have are through CIMAC."* One participant from Sample D noted, *"they provide us with crime analysis on our daily meetings."* In contrast, detective commanders from Sample E offered more critical perspectives, stating, *"we don't get anything from them"* and *"because the crime is out of hand, if they were managing it properly, I think crime would have been reduced."* Some participants from Sample D pointed to resource challenges, saying, *"due to manpower issues, the office is not able to function optimally."* These divergent views highlight an important insight, namely that the effectiveness of crime information management is not uniformly experienced across the SAPS. Frontline units such as detectives, who rely on tactical and actionable intelligence, often face delays or receive incomplete data. Conversely, those engaged in broader operational planning, such as station and VISPOL heads, appear more satisfied with CIMAC's outputs, which suggests a possible disconnect between analytical functions and investigative needs.

This study found that while the SAPS has formal structures and agreements in place to guide the collection and use of crime information, the practical implementation of these systems faces constraints. Challenges include insufficient resourcing, variable data integrity, and inconsistent communication between CIMAC offices and end-users. As one detective from Sample E summated, *"they are trying, even though they are not sufficiently resourced."* For data-driven policing to succeed, attention must be paid not only to the availability of crime information but also to the conditions under which it is collected, analysed, and distributed. Bridging the gap between analytical capacity and operational needs is essential for enhancing crime prevention outcomes across the SAPS.

The application/use of crime analysis

The literature reviewed in this study emphasised that crime analysis plays a crucial role in policing by transforming collected data from field reports, arrest sheets, and dispatch logs, into actionable intelligence. This information is then disseminated to line managers, supervisors, patrol managers and field personnel, enabling patrol managers to make informed, rational decisions when deploying members and developing patrol strategies (Horne, 2009:70; Taylor et al., 2013:5; Thibault et al., 2015:135; Tshishonga, 2022:205). Patrol divisions routinely use crime analysis products for apprehending offenders, directing patrols and developing crime prevention strategies, and for assigning personnel for foot patrols and special resource deployment (Cordner & Scarborough, 2010:330–331; Ratcliffe, 2007:5; Santos & Taylor, 2013:506–507; Thibault et al., 2015:135). Additionally, the literature revealed that crime analysis assists police administrators in resource allocation, planning, and the making of strategic and tactical decisions. It also supports responses to external information requests, informs budgeting and strategic planning, and aids the criminal justice system by providing evidence which is crucial to suspect identification and prosecution (Taylor et al., 2013:5). The literature revealed that crime analysis supports place- and offender-based analyses, and guides evidence-based interventions to address crime and disorder (Poblete, 2013:16). The evaluation of intervention outcomes is a critical component of crime analysis, helping to assess the effectiveness of policing strategies.

Empirical data collected from the participants reinforced the importance of crime analysis in keeping the police continuously informed about crime trends, and in supporting effective crime-prevention initiatives and investigations (Cordner & Scarborough, 2010:329–331; Horne, 2009:70–71; Govender, 2011:121). The majority of participants emphasised that the best use of crime analysis is achieved when findings and recommendations from crime analysts are carefully used in policing strategies. The international participants in this study highlighted the need for *"management buy-in to the crime analysis products provided by CIMAC,"* stressing that *"adherence to these products is essential for successful operational application"*.

The opinions of the study participants, on the effective use of crime analysis within the SAPS, were mixed. Many believed crime analysis is effectively used, although several disagreed. Notably, all of the Sample A participants (national and provincial crime registrars), who oversee the monitoring and evaluation of crime analysis units, reported that crime analysis is not effectively utilised. They lamented the lack of follow-up or feedback after operational members receive information and analysis products. One Sample A participant observed that *"skyrocketing crime incidents are an indication that the information that is being provided is not effectively utilised to inform policing operations and deployment"*. Participants from Sample B mostly felt that the products received from CIMAC *"provide a clear picture of crime"* and *"guide operational members on crime prevention focus areas"*. However, some Sample B participants cited "*insufficient resources", "commanders' reluctance to use the analysis products"* and "*a lack of feedback from operational members"* as challenges. In contrast, the majority of participants from samples C and D

concurred that *"crime analysis is effectively employed within [the] SAPS"*. Among Sample E participants, opinions were divided; while many believed CIMAC is effectively used, an equal number expressed concerns about its use, citing *"resource shortages", "inaccurate or improperly conducted crime analysis", "poor utilisation of products by crime prevention officials", and "inadequate feedback or follow-up on information provided"*.

Notably, international perspectives aligned with the local participants' views, suggesting that *"crime analysis is effectively used in their policing departments"*; however, the participants acknowledged that *"some countries have yet to recognise its importance"*. An international participant noted that *"where recognised, crime analysis is promoted and used effectively, contributing to saving police time, resources,* and *money"*. This study found that while crime analysis is recognised as a valuable tool within the SAPS and globally, challenges related to resource constraints, management engagement, and feedback mechanisms affect its optimal use and policing outcomes.

Data integrity challenges in the SAPS

In line with broader professional practices, crime analysis within the SAPS is not immune to operational challenges, with data integrity emerging as a significant concern (Poblete, 2013:16). The effectiveness of crime analysis is largely dependent on the quality of the data input. The literature reveals that if data are inaccurate, incomplete or untimely, the conclusions drawn from such data become unreliable, ultimately limiting the value of crime analysis in preventing and reducing crime (Breetzke, 2007:13; Edelstein & Arnott, 2019:17; Kempen, 2019:11; Palmiotto, 2013:16; Poblete, 2013:16). The findings revealed that SAPS crime analysis managers extract data from various systems, but the reliability of thereof is often compromised due to poor data capturing practices, resulting in flawed outputs. As one participant succinctly stated, *"the quality of our analysis is only as good as the data we get, and right now, that's a real problem"*.

The issue of poor-quality data is echoed in the literature, which emphasises that the accuracy of crime analysis is only as strong as the foundational data. When field members fail to take comprehensive notes, or when data are inefficiently captured in the SAPS CAS, the resulting statistics become questionable (Breetzke, 2007:13). Berning and Masiloane (2012:87) argue that inadequate information at police precincts and departments is a major threat to data integrity. Effective crime analysis, as the literature highlights, is reliant on accurate, timely, relevant, and reliable data (Berning & Masiloane, 2012:87; Van Graan & Van der Watt, 2014:151). The lack of awareness among SAPS members of the significance of the data they collect and input is another challenge. According to Breetzke (2007:13), Govender (2011:127) and Edelstein and Arnott (2019:5), members involved in note-taking and data capturing must understand the impact of their work on crime analysis and, by extension, on policing outcomes. The absence of such awareness leads to non-compliance with procedures designed to ensure data integrity. Moreover, inefficiencies in management – specifically the failure of station commanders and CAS controllers or MIC officials to conduct regular data quality checks – compound the problem (Sekhukhune, 2017:7–10; SAPS, 2019:20).

As the literature notes, when CSC commanders fail to ensure the accurate registration of case dockets on CAS, or when station commanders neglect their responsibilities in managing the investigation of cases, systemic inefficiencies emerge (SAPS, 2017:10). This has far-reaching consequences, as invalid data can lead to erroneous crime statistics, misinformed deployment strategies and a misplaced focus on incorrect crime patterns. Govender (2011:121) and Burger (2015:55) argue that operational shortcomings, such as weak command and control, poor consequence management, and inconsistent implementation of corrective measures, only serve to further weaken the integrity of SAPS crime analysis. Further challenges identified in the literature include the unavailability of adequate, high-quality data; limited training and education; a lack of knowledge about analytical techniques; the underutilisation of qualitative data; and the poor integration of crime analysis products into police operations. Feedback mechanisms are also scarce, limiting collaboration between analysts and operational personnel. Moreover, crime analysts face difficulty communicating with their counterparts in other jurisdictions, and there is a general shortage of formal training opportunities and published resources related to crime analysis (Berning & Masiloane, 2012:89; Poblete, 2013:16; Santos, 2017:32).

Participant feedback across all local samples (A–E) supported these literature findings. For them, a common concern was the lack of resources – particularly information technology (IT) equipment – needed to support crime analysis. As one participant noted, *"without the right tools and enough resources in the CIMAC office, we simply can't perform proper crime analysis"*. Regarding data integrity, participants cited issues such as insufficient or missing data, inaccurate system entries, incomplete information, and a lack of operational input. One participant explained that *"the problem is not just the data, it's also that we don't get information from members on the ground, or when we do, it's not useful."*

The international participants added insights into data integrity challenges, with one pointing out that *"it doesn't matter how well resourced a crime analysis unit is, if there is not a working relationship between the police and the crime analyst, then the work will not be effective."* The other participant highlighted generational divides in the adoption of technology, as *"the old crop of police officers are not acknowledging and accepting the benefits of technology,"* while newer management tends to be more supportive of tech-driven approaches to crime analysis. When asked to elaborate on coordination challenges, the international participants cited duplication and poor information sharing as significant issues. One noted that *"duplication of products or not sharing information are the biggest challenges. To avoid duplication, large agencies should maintain a database of intended or upcoming products, while smaller agencies could benefit from daily briefings."* The other explained, *"the biggest challenge is services and units and departments working in silos."* Both the literature and the empirical data revealed that challenges to data integrity – from poor-quality input data and management inefficiencies to technological deficits and limited training – undermine the effectiveness of crime analysis in the SAPS. These challenges reduce the operational value of crime analysis, affect the credibility of crime statistics, and impede informed policing.

Recommendations

Based on the findings drawn from the literature review and participant interviews, several critical recommendations are proposed to address the challenges related to data integrity in crime analysis and prevention within the SAPS. The recommendations aim to enhance the accuracy, completeness, and utility of crime data to support effective policing. Despite the SAPS's efforts to standardise data reporting, such as the MoA with Stats SA to align with SASQAF standards, serious challenges persist. These include underreporting, missing variables, delayed reporting, and a reliance on generalised crime categories. The study found that these data quality issues significantly weaken the value of crime analysis by limiting its ability to provide meaningful insights for policing. Therefore, the data used for crime analysis must be accurate, consistent, complete, and reliable, to effectively inform police decision making. To achieve this, it is recommended that the SAPS implement robust monitoring mechanisms to ensure effective and efficient data capturing across all internal systems. Personnel responsible for entering data into police systems and case dockets must be held accountable when data are incomplete, inaccurate, or not captured to a high standard. Since crime analysis depends on the integrity of the input data, the SAPS should prioritise developing and implementing a clear consequence management framework. The framework should address incomplete or omitted data in case dockets, incorrect crime incident registrations, the inaccurate recording of crime locations, and failures in the supervision and extraction of relevant crime information.

It is further recommended that quality assurance checks on crime data be institutionalised and enforced. Officers who neglect or fail to perform these checks should face consequences, as their omissions pose a serious threat to the integrity of crime analysis outputs. Simultaneously, there is a critical need to promote awareness and understanding among SAPS members (particularly those responsible for note-taking at crime scenes and those capturing information in systems) of the importance of their contributions to the broader crime analysis process. This appreciation of data quality procedures must be embedded within the organisational culture.

The findings highlight management inefficiencies at the station level, particularly in the failure to utilise crime analysis effectively in operational planning. Despite the availability of valuable insights from CIMAC units, station commanders often do not integrate these into strategic interventions or crime-prevention operations. Consequently, crime analysts are left unaware of the impact or relevance of their work. To address this, it is recommended that a culture of data-informed policing be actively promoted, especially among long-serving officers. Many officers tend to rely solely on reactive responses to emergency calls, rather than proactively using analysed data to understand crime trends and patterns. It is important to recognise that even seasoned officers may not have a comprehensive or current understanding of crime dynamics, which can be significantly enhanced through the insights generated by crime analysts.

Also recommended is a renewed emphasis on meeting key responsibilities, particularly in relation to management, command, control, and the monitoring of compliance with data and operational directives. The consequences of failure to adhere to these responsibilities should be clearly articulated and consistently enforced. It is recommended that corrective measures, consequence management strategies and disciplinary interventions not only be implemented but also carried through to completion, to ensure accountability and institutional effectiveness. Improving data integrity in the SAPS requires a multidimensional approach that includes technical oversight, cultural change, and firm managerial accountability. These recommendations, if implemented effectively, will contribute significantly to enhancing the role of crime analysis in supporting proactive, evidence-based policing.

Conclusion

In response to the growing recognition of crime analysis as a formal and vital component of modern policing, this paper set out to explore how data integrity influences crime analysis and, in turn, crime prevention within the SAPS. Effective information management forms the bedrock of intelligence-led policing. In the SAPS context, while partnerships such as the one with Stats SA indicate institutional recognition of its importance, significant gaps persist in the operationalisation of data integrity principles. These include systemic issues such as inaccurate or incomplete data entry, poor feedback mechanisms, and the underutilisation of crime analysis outputs in police planning and operations. When the quality of data is compromised, so too is the capacity of the police to develop timely, evidence-based responses to criminal threats. Thus, high-quality, accurate, complete, consistent, and reliable data are indispensable for generating actionable insights to effectively support crime prevention and detection.

Beyond technical concerns, cultural and managerial factors were found to play a critical role in shaping the utility of crime analysis. The reluctance among some police officers to adopt data-driven approaches, combined with weak oversight and insufficient accountability, hampers the full integration of crime analysis into day-to-day policing. Limited collaboration between analysts and investigators, inadequate training, and poor information-sharing practices further reduce the effectiveness of crime intelligence systems. Comparative insights from international contexts reveal that countries which have embedded crime analysis into their policing culture reap significant benefits in terms of efficiency, resource use, and crime reduction.

The researchers propose a set of targeted recommendations that include the implementation of robust monitoring mechanisms to ensure efficient and accurate data capture, the introduction of a consequence management framework to address non-compliance and data manipulation, and efforts to build awareness and appreciation of data quality procedures across all levels of the SAPS. Additionally, it is vital to cultivate a culture that values the use of analysed information for operational planning and decision making, particularly among senior management and frontline officers. Strengthening management and command-and-control processes, along with consistent disciplinary follow-through, will be critical to driving these reforms. Ultimately, the continuous improvement of information management and crime analysis practices anchored in a strong commitment to data integrity will enhance the SAPS's ability to prevent and investigate crime more effectively.

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