



MAKERERE

UNIVERSITY

**A FRAMEWORK FOR THE ADOPTION OF SOCIAL MEDIA IN CRIME
INVESTIGATIONS: CASE OF UGANDA POLICE IN KAMPALA
METROPOLITAN AREA**


**BY
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REG. NO: 2021/HD05/2265U
BIS (Mak)**

**A RESEARCH DISSERTATION SUBMITTED TO DIRECTORATE OF
RESEARCH AND GRADUATE TRAINING
IN PARTIAL FULFILLMENT OF THE AWARD OF DEGREE OF MASTER OF
INFORMATION TECHNOLOGY OF MAKERERE UNIVERSITY.**

JULY 2025

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I Adupa Bob Bruno do hereby declare that this dissertation report is original and has not been published and /or submitted for any other degree to any other university before

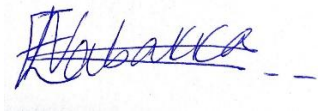
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DEDICATION

I dedicate this work to my Family for always encouraging me to keep on pushing until completion.

ACKNOWLEDGEMENT

I glorify the Almighty God for giving me wisdom, courage and carrying me through.

Special thanks to my supervisors Associate professor Rwashana Semwanga and Dr Evelyn Kigozi Kahiigi for the endless support and guidance throughout the research process. May the almighty bless you abundantly.

I extend my gratitude to my family, friends and colleagues that supported during the process.

I also want to thank the Uganda police force for giving me the chance to interact with the various police officials across their various capacities. Thank you for taking part in this.

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ACRONYMS

APP – Application
CBPR – Community Based Participatory Research
CCTV – Closed Circuit Television
CLO – Community Liaison Officers
COPS – Community Oriented Police Services
CP – Crime Pattern
DSR – Design Science Research
FBI - Federal Bureau of Investigations
ICT- Information and Communication Technology
IDT – Innovation Diffusion Theory
Interpol – International Criminal Police Organization
KPI – Key Performance Indicators
NDP – National Development Plan
OSINT – Open-Source Intelligence
SDG – Standard Development Goal
TAM - Technology Acceptance Model
UNICEF – United Nations Children’s Fund
UPF - Uganda Police Force
UTAUT - Universal Theory of Acceptance and Use of Technology
VS – Virtual Sessions

ABSTRACT

The exponential rise of social media platforms presents unique opportunities for enhancing crime investigation efforts within law enforcement agencies. This study investigates the integration of social media into crime investigation processes within the Uganda Police Force (UPF), focusing on the Kampala Metropolitan Area. Despite technological advancements and increased smartphone usage, the UPF has faced significant challenges in leveraging digital tools for timely evidence gathering, suspect identification, and digital forensics.

This research aimed to develop a practical framework to guide the adoption and use of social media in crime investigations. Using a Design Science Research (DSR) methodology complemented by an abductive research approach, the study collected primary data through structured questionnaires distributed to police personnel and analysed it using statistical tools. It further reviewed existing global frameworks and theoretical models such as the Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), and Crime Pattern Theory to inform framework development.

Findings indicated that perceived usefulness, ease of use, organizational support, training, and investigative protocols significantly affect social media adoption for crime investigations. The final framework was structured in three phases: pre-adoption, adoption, and post-adoption, each addressing specific functional, organizational, and technical requirements for digital investigation.

The framework was validated through expert reviews and statistical analysis, demonstrating its potential to improve digital evidence collection, suspect identification, witness location, and investigative efficiency. The study contributes to both academic research and practical implementation by offering a structured, context-specific model that can be adapted by law enforcement agencies across similar settings.

CHAPTER ONE

1.0 Introduction

Definitions of Key Terms

Social media is a term often used to refer to new forms of media that involve interactive participation (Manning, 2014).

Crime is defined by the Oxford English Dictionary as 'An action or omission which constitutes an offense and is punishable by law.'

Crime investigation refers to the systematic process of collecting, analysing, and preserving evidence to identify, apprehend, and prosecute offenders (Osterburg & Ward, 2014).

Digital evidence consists of information stored or transmitted in binary form that may be relied upon in court, including social media posts, messages, images, videos, and metadata (Casey, 2011).

Adoption refers to the process through which an individual, group, or organization accepts and integrates an innovation, practice, or idea into their existing routines, behaviours, or systems (Rogers, 2003).

A framework is described as a conceptual model that provides a systematic structure for research by organizing variables, concepts, and relationships (Miles & Huberman, 1994).

In recent years, advances in Information Communication Technology have significantly transformed human communication, giving rise to current trends such as social media. Social media was identified as one of the most influential waves of digital technology. As of 2019, (Market.us 2020) showed that when it comes to using social media on mobile, Eastern Asia tops the bill with 70%, followed by Northern America at 61%, Central America at 59%, and Western Europe at 45%, Africa stood at 8% (Kemp, 2019).

In January 2022, there were an estimated 13.92 million internet users in Uganda (Kemp, 2022), 2.80 million being social media users. Social media statistics released by Next Com showed that there were an estimated 4.2 billion active social media users worldwide as of Jan 2023. An article published in the New Vision newspaper dated 7/7/2023 indicated that the Internet penetration rate in Uganda was 42 %, and social media usage stood at 2.5 million, representing a 5.6% penetration across the country. Users sampled in the research used WhatsApp most, with 98% affirming they use it, Facebook took 92%, 69% said they use Twitter, while Instagram had 62%. The less-used networks included LinkedIn at 36%, Skype at 30%, 24% Snap Chat, Google Hangouts at 12%, Tinder at 6%, and Telegram at 4% (Kanaabi, 2023). The widespread use of mobile phones and social media has changed the way citizens and police agencies communicate with each other in relation to crime (Stieglitz, 2018).

1.1 Background

Today, Information and communication Technologies (ICT) have changed every aspect of society and police organizations have not been spared either. ICTs have been crucial in today's digital world transformation. Organizations all over the globe are using ICTs to reduce costs, improve efficiency, and curb criminal activities through enhanced investigative capabilities (Ashrafi & Murtaza, 2008).

In recent decades, advances in Information and Communication Technology (ICT) have significantly transformed how law enforcement conducts investigations. Among the most influential developments is the proliferation of social media—web-based platforms that facilitate real-time, interactive communication and content sharing. These platforms have evolved beyond social interaction tools into critical instruments for criminal investigations, evidence gathering, and open-source intelligence (OSINT) (Stieglitz et al., 2018; Gruzd & Mai, 2020).

Social Media in Criminal Investigations: Global Context

Social media platforms have increasingly been used by law enforcement agencies worldwide to aid in investigations. In the U.S. and Europe, platforms like Twitter and Facebook have been adopted for suspect identification, digital evidence collection, and witness location (Heverin & Zack, 2010; Deneff et al., 2013).

According to the National Law Enforcement Policy Centre (2010), law enforcement agencies use social media for investigative purposes when seeking evidence or information about missing or wanted people, gang participation, and Internet crimes such as cyberstalking or cyberbullying. For example, in Kigali, Rwanda, police collaborate with prosecutors and use social network sites as evidence in cases. Information found online helps supplement other evidence already gathered by the police (National Law Enforcement Policy Centre, 2010).

In one case, police and prosecutors convicted an individual of operating a vehicle under the influence of a controlled substance. The individual had smoked marijuana on the day he crashed his vehicle and killed another individual inside. On his Facebook page, the individual referenced his marijuana use and posted photos of a bong (Michalos, 2010). This example illustrates what many law enforcement agencies are doing throughout the world, in which police and prosecutors use the information found on social media sites to gather and enhance evidence against an individual.

According to the Global Burden of Disease study in 2021, over 415,000 people died from homicide crimes globally. This was around three times the number killed in armed conflict and terrorism combined. In 2019, an estimated 1,203,808 violent crimes occurred nationwide in the United States of America (FBI, 2019).

In Africa, specifically Niger, social media was seen to facilitate human trafficking disguised with “decent work” (Interpol, 2022). Crime in developing countries can manifest in various forms, influenced by a combination of socio-economic factors, political instability, and other contextual elements. It is important to note that crime is a complex and multifaceted issue, and the examples provided here are not exhaustive. Additionally, crime rates and types can vary widely within and between developing countries. In some urban areas of developing countries, street crimes such as theft, robbery, and assault can be prevalent. For instance, cities in Latin America, such as Caracas in Venezuela or San Salvador in El Salvador, have faced challenges related to high rates of street crime and violence. With the increasing use of technology, cybercrime has become a global concern. Developing countries are not immune, and issues

such as online fraud, identity theft, and hacking can affect individuals and businesses. For example, Nigeria has been associated with various forms of cybercrime, including email fraud and online fraud.

The Uganda Context

In Uganda, the adoption of social media for crime investigations remains nascent and underutilized. Despite a growing population of internet users of 13.92 million as of January 2022 (Kemp, 2022) and increasing crime rates (Uganda Police Force, 2022), there is limited integration of these platforms into formal investigative strategies. This disconnect has contributed to delays in evidence collection, suspect identification, and case resolution.

According to the Global Burden of Disease study in 2021, over 415,000 people died from homicide crimes globally. In 2019, an estimated 1,203,808 violent crimes occurred nationwide in the United States of America (FBI, 2019). In Africa, specifically Niger, social media was seen to facilitate human trafficking disguised with "decent work" (Interpol, 2022).

Table 1.1: showing the volume of crime between 2020, 2021 and 2022 in Uganda. (Source: Annual Crime Report)

S/No	Crime Category	2022	2021	2020
1	Theft	61508	43583	41950
2	Assaults	32041	29317	30712
3	Domestic violence	17698	17533	17664
4	Sex-Related offenses	23653	16373	16144
5	Economic /corruption Crimes	13202	10966	10057
6	Threatening Violence	10345	10408	10844
7	Breakings	13826	10148	10113
8	Child Related Offenses	13489	8681	9225
9	Criminal Trespass	8418	7636	7505
10	Malicious Damage to Property	7838	6980	7370
11	Robberies	6854	5275	5302
12	Homicide	7838	3912	4460
13	Arson (General)	1747	1803	1614
14	Narcotics	2797	1668	1714
15	Media offenses	140	797	1033
16	Escaping from lawful custody	988	751	813
18	Terrorism	15	21	2
19	Others	13162	20172	19377
	TOTAL	231653	196081	195931

The above data indicated high crime volumes in Uganda between 2020, 2021, and 2022. According to UBOS (2022), there were an estimated 44,212,800 million people in Uganda in 2022. This means that, on average, 524 out of 100,000 people were victims of crime in the year 2022.

1.2 Problem statement

Despite the increasing rate and sophistication of crime in Uganda, evidenced by an 18%, 1.5%, and 0.1% rise in reported cases in 2023, 2022, and 2021 respectively, the Uganda Police Force continues to rely heavily on traditional, manual systems of crime investigation (Uganda Police Force, 2022). Challenges such as limited ICT infrastructure, absence of digital forensic capabilities, and inadequate investigative tools have contributed to delays in evidence collection, suspect identification, and case resolution by the Uganda police and these has affected the crime victims negatively in terms of delayed justice.

Globally, social media has emerged as a critical tool for crime investigations, enabling law enforcement to gather digital evidence, trace suspects, analyse criminal networks, and conduct open-source intelligence (OSINT) operations (Gruzd & Mai, 2020). However, existing frameworks (e.g., Curtis-Ham et al., 2020; Resende de Mendonça et al., 2020) primarily focus on predictive policing or offender profiling, offering limited guidance on the operational integration of social media within investigative processes, particularly in resource-constrained environments like Uganda.

This gap highlights the need for a theory-informed framework that addresses the adoption and utilization of social media as an investigative tool in crime detection and evidence gathering. The absence of a national framework guiding law enforcement's use of social media for investigative purposes underscores critical inefficiencies in Uganda's crime investigation system (Kristin, 2022), leaving investigators without standardized protocols for digital evidence collection, chain of custody procedures, or legal guidelines for social media-based investigations.

1.3 General Research Questions

To address the problem, answers to the following research questions were sought in the study. What framework can be developed to guide the effective adoption of social media in crime investigations?

1.3.1 Specific Research Questions

- (i) What are the requirements needed to develop a framework for the adoption of social media in crime investigations?
- (ii) What does a framework that meets the requirements for adopting social media in crime investigations look like?
- (iii) To what extent can the framework for the adoption of social media in crime investigations be tested and validated to ensure it meets the requirements?

1.4 General Objective

The objective of the study was to develop a framework for the adoption of social media in crime investigations.

1.4.1 Specific Objectives

- (i) To determine the requirements for development of a framework for the adoption of social media in crime investigations.
- (ii) To design a framework for the adoption of social media in crime investigations.
- (iii) To test and validate the designed framework to ensure that it fulfills the requirements identified in objective (i).

1.5 Scope

Theoretically, the designed framework for the adoption of social media in crime investigations addressed the three stages of technology adoption: pre-adoption, adoption, and post-adoption. This study covered aspects of evidence collection, suspect identification, witness location, digital forensics, and investigative processes using social media.

Geographically, the study was conducted within the 18 police divisions in the Kampala metropolitan area of Uganda; these included five (5) from the Kampala East region, seven (7) from the Kampala North region, and six (6) from the Kampala South region (Kamusiime, 2021). This study was conducted between January 2022 and July 2025.

1.6 Significance /Benefits of the study

1.6.1 Police Force

The study empowers the Police Force to actively respond timely and accurately to investigative leads generated through social media, improving evidence collection and suspect identification rates. The findings are specifically useful for Criminal Investigation Departments (CID) and Digital Forensics Units on appropriate social media strategies to adopt for criminal investigations.

1.6.2 Other Researchers/ Academia

The research adds a more analytical approach to the adoption and usage of social media platforms for investigative purposes, standardized procedures for conducting digital investigations, and offers detailed background information for interested researchers to undertake studies related to social media and crime investigations. This research makes a scientific contribution to Information Technology as a framework for the adoption of social media in crime investigations and provides guidelines that the police sector can adopt for investigative processes using social media.

1.6.3 General Public

The study helps create awareness about how citizens can assist police investigations through social media while understanding privacy and legal boundaries. Upon implementation, there will be timely reporting and response from the public and police, respectively. Additionally, the findings add to existing knowledge of crime investigations, thereby improving public trust in police investigative effectiveness.

1.6.4 Theoretical contribution

The study extends existing theoretical frameworks such as the Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), and Crime Pattern Theory by contextualizing them for digital investigation in a low-resource, public sector environment like the Uganda Police Force. While prior models emphasize factors such as perceived usefulness and facilitating conditions, this study integrates digital evidence protocols, chain of custody requirements, and investigative workflow elements typically underrepresented in traditional technology adoption models.

The framework includes three distinct but interconnected phases: pre-adoption, adoption, and post-adoption. Unlike generic models that focus primarily on the act of adoption, this framework provides detailed operational tasks and success factors across the adoption lifecycle specifically for investigative purposes, including digital evidence collection, content verification, witness tracing, and post-adoption performance monitoring of investigative outcomes.

1.6.5 Contextual and Global Relevance

While highly localized in the context of Kampala's policing system, the study reflects challenges echoed in other Global South contexts such as Kenya, Nigeria, and Bangladesh, where law enforcement agencies face similar hurdles with ICT integration in investigations (Ochola, 2021; Al-Saggaf & Simmons, 2015). The framework can thus serve as a benchmark for digital investigation reforms in similarly structured environments.

Furthermore, it draws on successful practices seen in global contexts. For instance, aspects of digital evidence verification mirror techniques used in Brazil's social media monitoring systems (Resende de Mendonça et al., 2020), and investigative strategies are inspired by OSINT practices implemented in the U.S. and Europe.

1.7 Justification of the study

This research aims to assist the Uganda Police Force minimize delays experienced in evidence collection, suspect identification, witness location, and investigative processes that result in the possibility of justice not being served, high unsolved case rates, and prolonged investigation timelines (Kamusiime, 2022). The benefits highlighted by the framework include enhanced digital evidence gathering capabilities, improved suspect identification rates, faster witness location, and the potential for enhanced public cooperation in providing investigative leads.

This research is aligned with goal 16 of the Standard Development Goal (SDG), which is to "Promote peaceful and inclusive societies for sustainable development, provide access to justice for all, and build effective, accountable, and inclusive institutions at all levels." This research also speaks to the National Development Plan III of Uganda, where Chapter 14 (Digital transformation) and Chapter 19 (Governance and Security) are incorporated into the research. Digital transformation involves the use of digital tools like social media to change how law enforcement operates and delivers investigative outcomes. Social media platforms are a major technological resource that the Ugandan Police Force can systematically leverage to improve its overall investigative efficiency and output.

CHAPTER TWO

Literature Review

2.0 Introduction

This chapter presents a review and discussion of literature on social media adoption in crime investigations within the police sector, theoretical frameworks, and crime investigation frameworks. It further provides a critical review of current frameworks used in digital investigations, the success factors for successful adoption of social media in crime investigations and concludes with a summary of findings on existing frameworks.

2.1 Overview of social media in crime investigation

Social media has transformed the way law enforcement agencies conduct investigations, and it should be embraced and adopted by police. Law enforcement agencies use social media for investigative purposes when seeking evidence or information about missing or wanted people, gang participation, witness identification, and Internet crimes such as cyberstalking or cyberbullying. For example, in Kigali, Rwanda, police work with prosecutors and use social network sites as evidence in cases ranging from underage drinking to child custody cases. Information found online helps supplement other evidence already gathered by the police (National Law Enforcement Policy Centre, 2010).

In one case, police and prosecutors convicted an individual of operating a vehicle under the influence of a controlled substance. The individual had smoked marijuana on the day he crashed his vehicle and killed another individual inside. On his Facebook page, the individual referenced his marijuana use and posted photos of a bong (Michalos, 2010). This example illustrates what many law enforcement agencies are doing throughout the world, where police and prosecutors use information found on social media sites to gather and enhance evidence against individuals.

Social media platforms have increasingly been used by law enforcement agencies worldwide to aid in investigations, community engagement, and evidence gathering. In the U.S. and Europe, platforms like Twitter and Facebook have been adopted for public alerts, crowd-sourced information, and digital surveillance (Heverin & Zack, 2010; Deneff et al., 2013). However, the focus has often been on communication rather than full integration into investigative systems.

In Africa, emerging studies highlight how digital platforms are becoming vital for modern investigations. Peters and Ojedokun (2019) examined social media utilization in Lagos, Nigeria, and found that although adoption was low, there was strong potential for real-time information sharing and evidence collection. In Uganda, Kamusiime (2018) noted the rollout of the UPF Mobile App, but its impact on investigations remains limited due to poor public awareness and accessibility challenges.

2.2 Police use of social media

The emergence of the community-oriented policing movement in the 1980s elicited a philosophical shift in law enforcement's intent from a reactive model, where officers respond to community problems as they occur, to a more proactive model, where officers anticipate the needs of their

communities through community interaction and communication (Reisig & Giacomazzi, 1998; Rosenbaum, 1988). Social media may be one way for law enforcement agencies to fulfill this goal while also enhancing investigative capabilities.

Overall, findings among the limited number of studies exploring the predominant role of social media in policing focus on investigations and communications with the public (Community Oriented Policing Services (COPS), 2013; Deneff et al., 2013; LexisNexis et al., 2014).

In Uganda, the police have some social media presence and use some platforms such as Facebook, TikTok, Instagram and YouTube. These platforms have assisted the Uganda police investigate some criminal activities. The police also use social media to quickly and fast track criminals as they usually post on their social media handles.

Overall, findings among the limited number of studies exploring the predominant role of social media in policing focus on communications with the public and investigations (Community Oriented Policing Services (COPS), 2013; Deneff et al., 2013; LexisNexis et al., 2014). Crump's (2011) content analysis of Twitter use by 39 police forces and 402 individual officers in England and Wales found that Twitter has mostly been used as a way of bolstering already active means of police communication. Social media accounts were mostly used to push out information such as police patrol activity, requests for information, and as a public relations tool. Similarly, in a content analysis of 1,984 public author tweets by Twitter accounts belonging to 30 U.S. cities with populations of more than 300,000, Heverin and Zack (2010) found that police departments do not use Twitter to engage in direct communication with the public. Instead, Twitter is primarily used to report on crime/incidents, give departmental information, provide details on upcoming events, and report on traffic. A content analysis of Facebook accounts from the 23 largest police agencies in the United States indicated police departments that post frequently tend to communicate crime-related messages, while lower-frequency posters tend to promote public relations (Lieberman et al., 2013).

2.2.1 Police adoption of social media

The extent of social media's spread in law enforcement agencies for investigative purposes has been documented in a few studies. The Bureau of Justice Statistics report (Reaves, 2015) on police-department technology found that 58 percent of all agencies used social media of some kind, with those departments serving larger populations having a higher percentage (ranging from 89 to 100 percent) using social media compared to smaller departments (ranging from 36 to 79 percent).

In a recent survey of 553 law enforcement agencies by the International Association of Chiefs of Police (IACP 2015), 96.4 percent of organizations reported using some form of social media. Findings from previous IACP surveys have shown that the number of law enforcement agencies that report using social media in some capacity has consistently increased from 92.4 percent in 2012 to 95.9 percent in 2013 (IACP, 2012, 2013).

As of 2015, 40.0 percent of agencies that were not currently using social media were considering adoption within the following six months (IACP 2015). 94.2 percent of the sample, and Twitter

reported that Facebook was used by 71.2 percent. However, the IACP surveys tended to reflect municipal police departments (86.6 percent of the sample) and not sheriff's offices (2.7 percent). The factors that may influence the adoption of social media have not been thoroughly explored. Analogous situations do exist to inform this line of inquiry. One Study (Rosenbaum et al., 2011), using a national probability sample of municipal police department websites, found that departments with an emphasis on community policing that served large populations were more likely to have created an agency website. Likewise, Skogan and Hartnett's (2005) study into police innovation found that agency characteristics, such as organizational resources and experience in using the latest information technology, were key to the implementation of the innovation. It could make sense that some of these factors may lead to the adoption and use of social media as well.

2.2.2 Factors affecting the adoption of social media in crime investigation in the police sector.

2.2.2.1 Technology Factors

Digital Evidence Authenticity and Admissibility Concerns

The extent to which investigators believe social media evidence can be authenticated, preserved with proper chain of custody, and admitted in Ugandan courts. Courts increasingly scrutinize social media evidence authenticity, requiring proof of collection circumstances, digital chain of custody, and preservation methods (Angus-Anderson, 2016; Bosco Legal, 2024).

Real-Time Intelligence Capabilities

Police officers' perception of social media's ability to provide immediate situational awareness during ongoing incidents, track suspects' movements, monitor criminal networks, and gather crowd-sourced information. Social media enables real-time monitoring of activities and locations, with geotagged content providing valuable assets for tracking suspects and linking individuals to crime scenes (Burley, 2025; Kaseware, 2021). Real-time intelligence provides immediate insights enabling prompt action, contrasting with traditional methods relying on outdated information (Cognyte, 2025).

Privacy and Legal Compliance Concerns

Officers' understanding of legal boundaries around surveillance, data collection from social platforms, and compliance with Uganda's data protection laws when conducting investigations. Law enforcement use of social media raises acute privacy, security, and civil rights concerns, with constitutional protections complicating surveillance practices (Congressional Research Service, n.d.; Electronic Frontier Foundation, 2025).

Cross-Platform Investigation Complexity

The challenge of monitoring and analyzing information across multiple platforms (Facebook, Twitter, WhatsApp, TikTok, Telegram), each with different data structures, privacy settings, and access requirements. Modern investigations require automated tools conducting cross-platform searches and correlating data simultaneously, as manual searches prove highly time-consuming (ShadowDragon, 2025). Platforms employ diverse formats and structures, hindering creation of

common programming interfaces and requiring flexible analytical approaches (Aggarwal et al., 2017).

2.2.2.2 Organization Factors

Digital Forensics Infrastructure Readiness

Availability of specialized tools for social media analysis (social network analysis software, geolocation tools, metadata extraction tools), forensic workstations, and evidence storage systems within the Kampala Metropolitan Police. Infrastructure encompasses hardware and software necessary for systematic collection, preservation, and analysis of social media evidence in legally admissible formats (Jatheon, 2025; NBFTools, 2025). Open-source tools provide cost-effective alternatives for resource-constrained agencies (Blue Voyant, 2023).

Specialized Training in Social Media Intelligence (SOCMINT)

Access to training specifically in open-source intelligence gathering, undercover online operations, social network analysis, and platform-specific investigation techniques—distinct from general ICT training. SOCMINT represents methodical processes of collecting, analyzing, and interpreting public data from social media platforms, requiring specialized skills beyond traditional investigative training (McAfee Institute, 2025; Datastat Training Institute, 2025)

Inter-Agency Data Sharing Protocols

Established mechanisms for sharing social media intelligence between Criminal Investigations Department (CID), Counterterrorism, Cybercrime Unit, and other specialized units, as well as with telecommunications companies and social media platforms. Social media intelligence often requires collaboration across organizational boundaries, with effective data sharing enabling law enforcement to expand surveillance reach (Walsh, 2020). For Uganda Police Force, protocols must address legal requirements for information exchange, data protection standards, access control mechanisms, and procedures for obtaining data from international platforms.

Command Structure Support for Digital Investigations

Senior officers' recognition of social media as a legitimate investigative tool, allocation of time for digital investigations within workload, and performance evaluation criteria including digital investigation outcomes. Implementing digital investigation initiatives requires strategic vision, technology evaluation, cost assessment, and addressing barriers such as lack of strategy and resistance to change (Policing Bureaucracy Task Force, 2005).

2.2.2.3 Investigation Factors

Suspect Digital Footprint Assessment Capability

Officers' ability to build comprehensive digital profiles of suspects, map social connections, identify aliases and fake accounts, and link online personas to real-world identities. Digital footprint assessment encompasses systematic analysis of suspects' social media activity, examining posts, interactions, and connections to establish behavioral patterns (Choo, 2011; NBFTools,

2025). Advanced capabilities include reverse image searching, metadata analysis, network mapping, and behavioral analysis (Caviglione et al., 2017).

Community Trust in Digital Engagement

Public willingness to report crimes or share information through social media channels, influenced by perceptions of police legitimacy, confidentiality concerns, and previous experiences with digital reporting mechanisms. Community trust fundamentally shapes effectiveness of police social media strategies, with trust levels influencing citizen participation in information sharing (Meijer & Thaens, 2013). However, trust can be undermined by perceptions of mass surveillance, political monitoring, or abuse of social media access (Ferguson, 2017).

Cybercrime Investigation Competency

Specific skills in investigating crimes originating or facilitated through social media, including online fraud, cyberbullying, revenge porn, recruitment for terrorism, and hate speech rather than merely using social media to investigate traditional crimes. Cybercrime investigation requires understanding of digital crime commission, online criminal ecosystems, and technology-facilitated offense patterns, distinct from conventional crime investigation (Casey, 2011; Quick & Choo, 2014).

Resource Constraints vs. Investigation Demands

The gap between investigation needs (data bundles, smartphones, laptops, software licenses) and available budgets in resource-constrained environments, affecting sustained social media monitoring capabilities. Resource constraints represent critical barriers to technology adoption in developing country contexts, with resource availability significantly influencing technology acceptance (Huang & Chuang, 2007; Hu et al., 2005).

2.2.2.4 Social and Cultural Factors

Language and Local Context Understanding

Ability to interpret social media content in local languages (Luganda, Runyankole, etc.), understand local slang, decode language used by criminal networks, and interpret cultural contexts of communication. Linguistic analysis capabilities prove essential for effective social media intelligence, particularly when investigating hate speech, extremist content, or coded criminal communications relying on cultural and linguistic nuances (Cohen et al., 2014). Social media intelligence tools often focus on English-language content, creating gaps when investigating suspects communicating in indigenous African languages.

Resistance from Traditional Investigation Culture

Tension between conventional "boots-on-the-ground" investigation methods valued in police culture and newer digital investigation approaches, affecting adoption particularly among veteran officers. Police organizational culture traditionally emphasizes physical presence, personal informant networks, and tangible evidence, potentially creating scepticism toward digital investigation methods (Davis, 1989; Zain et al., 2005). Resistance manifests through scepticism

about digital evidence reliability, preference for traditional techniques, concerns that digital investigation reduces "real police work," and generational differences in technology comfort.

Public Perception of Police Social Media Surveillance

Citizens' concerns about mass surveillance, political monitoring, or abuse of social media access, affecting cooperation and information sharing with police. Historical surveillance abuses create legitimate concerns about contemporary social media monitoring, with communities particularly wary of digital surveillance (Ferguson, 2017). Public perception concerns encompass fears about surveillance scope, potential for political misuse, adequacy of oversight mechanisms, and possibilities for error or abuse. Within Uganda's context, public perceptions reflect historical experiences with state surveillance and concerns about political monitoring. Building positive perception requires transparency about monitoring policies, robust oversight mechanisms, and consistent respect for civil liberties.

2.3 Theoretical Frameworks

A wide number of theories and models have been employed in studying ICT adoption. These theories and models focus on people's intention to engage in a certain behaviour (adopt and use ICT) as a major theoretical foundation. Many theories of technological acceptance have been proposed in contemporary information system research literature.

2.3.1 Technology Acceptance Model (TAM)

TAM is a model that explains the determinants of user acceptance of a wide range of end-user computing technologies (Davis, 1989). In TAM, Davis identified two theoretical constructs: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU); these affect the intention to use a system.

In the context of crime investigations:

Perceived Usefulness: Belief that social media will improve investigative outcomes (faster suspect ID, better evidence, witness location)

Perceived Ease of Use: Belief that using social media for investigations is straightforward and requires minimal effort.

Several research studies have used TAM as their theoretical background to explain ICT adoption and use in law enforcement contexts. Researchers have confirmed that PU has a positive relationship with both adoption intention (Davis, 1989) and continuance intention.

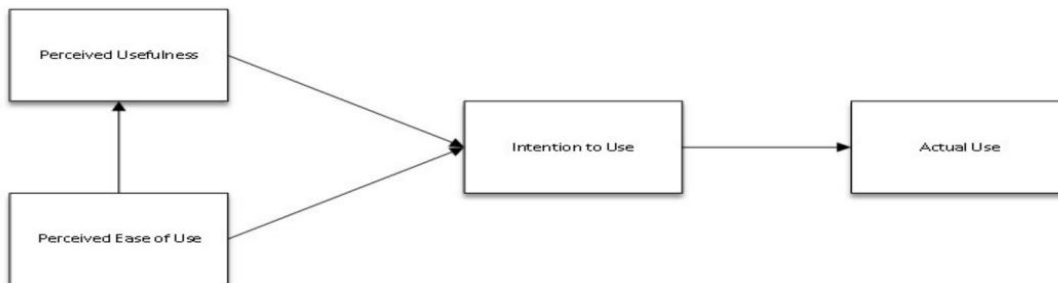


Figure 2.1: Showing the TAM framework source: (Davis, 1989)

2.3.2 Unified Theory of Acceptance and Use of Technology (UTAUT)

UTAUT provides a refined view of how the determinants of intention and behaviour evolve over time. Its assumptions are that there are three direct determinants of intention to use (performance expectancy, effort expectancy, and social influence) and two direct determinants of usage behaviour (intention and facilitating conditions) (Venkatesh et al., 2003).

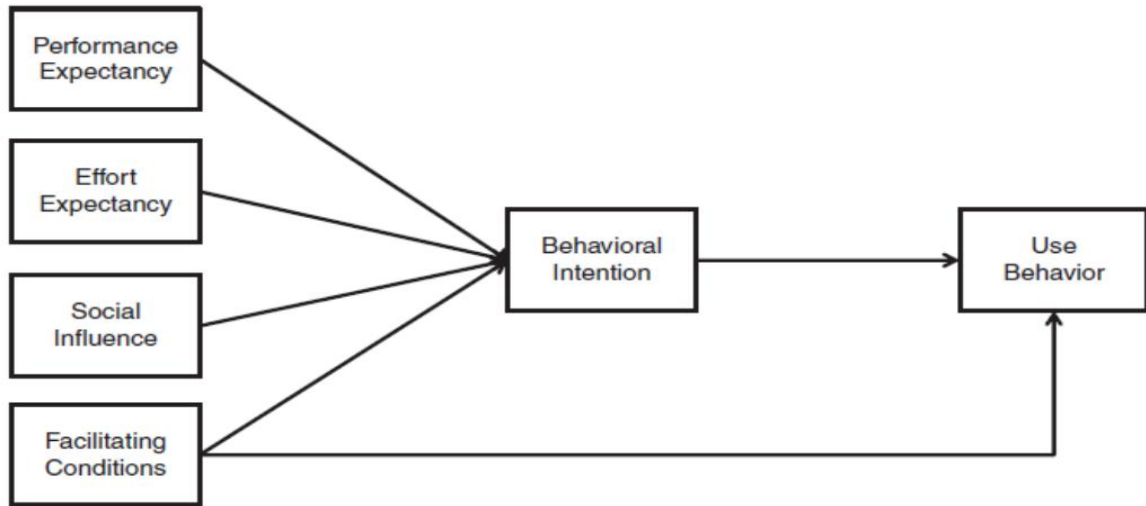


Figure 2.2: Showing the UTAUT framework source: (Suki and Norazah.2018)

2.3.3 Innovation Diffusion Theory (IDT)

The goal of IDT is to understand the adoption of innovation in terms of four elements of diffusion: innovation, time, communication channels, and social systems. IDT states that an individual's adoption behaviour is determined by perceptions regarding the relative advantage, compatibility, complexity, trialability, and observability of the innovation (Rogers, 2003).

In investigations:

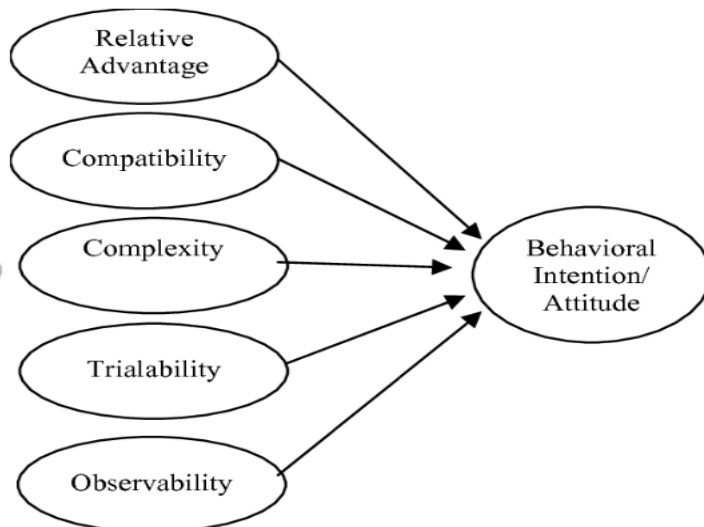


Figure 2.3: Showing the IDT framework. source: (Md Nor et al., 2010)

2.4 Related social media and Crime Investigation Frameworks

2.4.1 A framework for estimating crime location choice based on awareness space.

This framework extends Crime Pattern Theory, proposing a theoretical framework that aims to explain how offenders' previous routine activity locations influence their future offense locations (Curtis-Ham et al., 2020).

The framework is set in the context of crime pattern (CP) and rational choice explanations for crime location choice. Crime pattern theory holds that offenders commit crimes where crime opportunities coincide with their awareness space around and between routine activity nodes, such as their homes, schools, workplaces, shopping, and recreation locations.

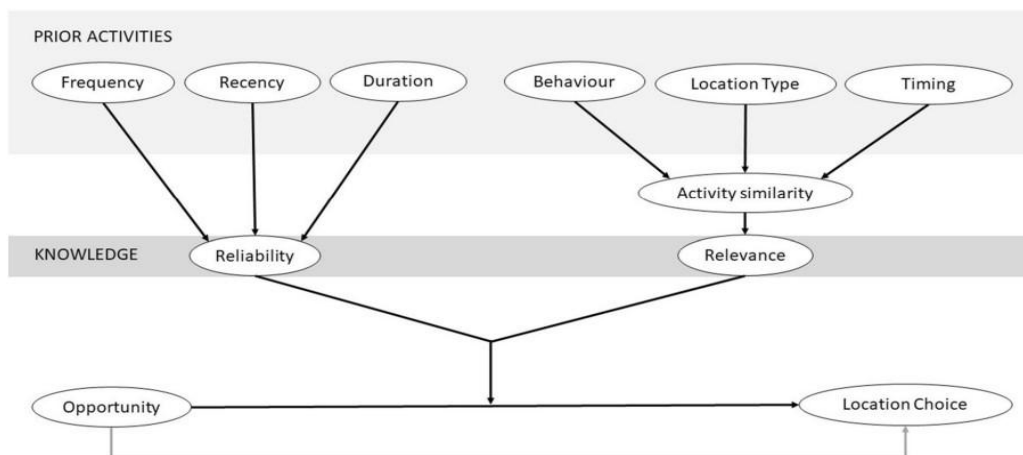


Figure 2.4: framework for estimating crime location choice based on awareness space.

Source: Adapted from (Curtis-Ham et al., 2020).

2.4.2 A Framework for Addressing Violence and Serious Crime

This framework examines an important crime prevention strategy - focused deterrence. This strategy seeks to change offender behaviour by understanding underlying crime-producing dynamics and implementing a blended set of law enforcement, community mobilization, and social service actions (Braga, 2021).

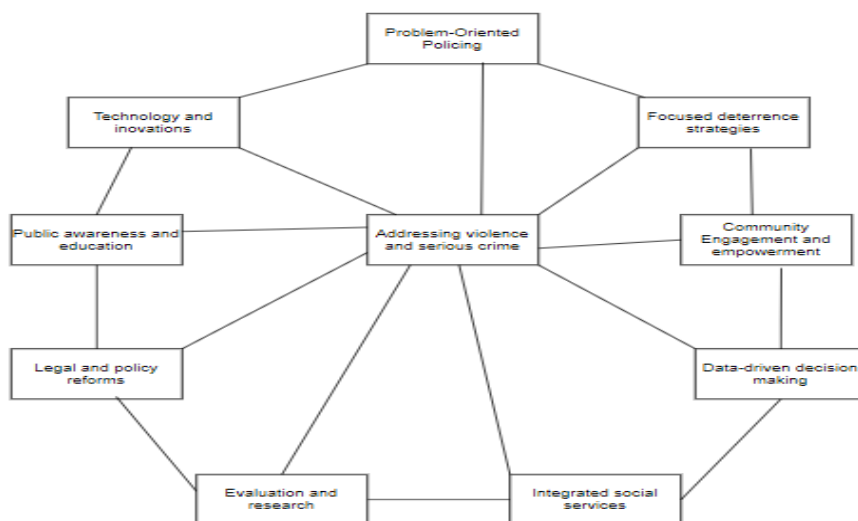


Figure 2.5: Framework for Addressing Violence and Serious Crime. Reproduced from (Braga, 2021)

2.4.3 A Framework for Detecting Intentions of Criminal Acts in social media: A Case Study on Twitter

This framework aimed at providing data that supports selection of suspicious posts and intention classification using Criminal Slang Expression (Resende de Mendonça et al., 2020). Input data are small text posts extracted from social networks, filtered for posts potentially related to crimes.

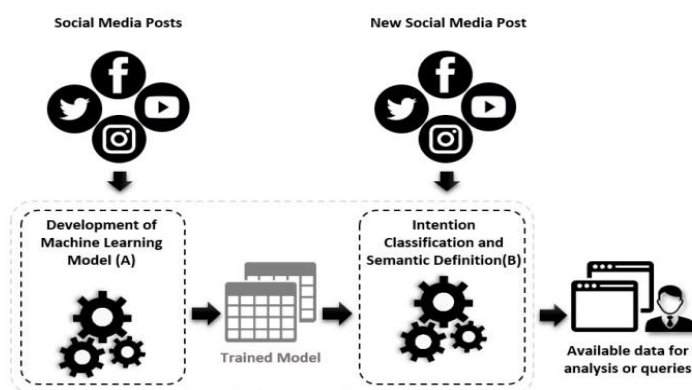


Figure 2.6: Framework for Detecting Intentions of Criminal Acts in social media. Source: Reproduced from (Resende de Mendonca et al., 2020)

2.4.5 Summary of findings

Table 2.1: Showing the summaries of the above frameworks.

Framework	Contribution /Strength	Weaknesses/Issues
A framework for estimating crime location choice based on awareness space (Curtis-Ham et al., 2020)	Uses offenders' previous routines to estimate future crime locations; focuses on spatial patterns	Neglects digital crimes; no guidance on using social media for evidence collection; lacks investigative protocols
A Framework for Addressing Violence and Serious Crime (Braga, 2021)	Focuses on community engagement, deterrence, and crime prevention strategies	Does not provide digital investigation guidance; lacks social media integration protocols
A Framework for Detecting Intentions of Criminal Acts in social media: (Resende de Mendonca et al., 2020)	Focuses on detecting suspicious criminal messages using algorithms and slang expression analysis	Does not address evidence authentication, chain of custody, or investigative workflow integration

2.5 Current Investigation Approaches in Uganda

Technological and Community-Based Crime Investigation Mechanisms in Uganda

The Uganda Police Force has progressively adopted multiple investigative mechanisms to address criminal activity within the country, reflecting both community-oriented and technology-driven approaches to law enforcement. These initiatives represent efforts to modernize policing practices while maintaining community engagement.

Community Policing Initiatives

The Uganda Police Force pioneered community policing as early as 1989, establishing a foundational framework for collaborative crime prevention and investigation (Trojanowicz et al., 1998). This approach institutionalized Community Liaison Officers (CLOs) at every police station nationwide, creating a systematic bridge between law enforcement agencies and local communities. The CLOs have been particularly effective in facilitating Neighbourhood Watch schemes and Crime Prevention Panels, which serve as grassroots mechanisms for intelligence gathering and early crime detection. This community-centric model acknowledges that effective criminal investigation extends beyond reactive policing to encompass initiative-taking engagement with citizens who possess localized knowledge of criminal patterns and suspicious activities.

Digital Service Delivery Platform

The development of the Uganda Police Force mobile application represents a significant step toward digital transformation in law enforcement service delivery (Kamusiime, 2018). This

platform provides citizens with comprehensive information including lost and found property databases, directory services listing police stations with direct contact details for officers, and geolocation features enabling users to identify their nearest police station. From an investigative perspective, this digital infrastructure facilitates more efficient reporting mechanisms and enhances accessibility to police services, potentially reducing response times and improving the documentation of criminal incidents.

Surveillance Technology Integration

The deployment of Closed-Circuit Television (CCTV) camera networks constitutes a technological enhancement to the Uganda Police Force's investigative capabilities. The footage extracted from these surveillance systems serves dual purposes: retrospective investigation of criminal activities through digital evidence collection and real-time monitoring of suspects. This technological adoption aligns with global trends in evidence-based policing, where visual documentation provides corroborative evidence that can strengthen criminal investigations and prosecutions.

2.5.1 Challenges with Current Approaches

The Uganda Police Force's current investigation mechanisms face multiple interconnected challenges that significantly impede investigative effectiveness and timeliness. The most critical challenge is the disconnect between citizen behavior and formal reporting channels, as evidenced by UNICEF's (2011) survey revealing that citizens remain unwilling to make official statements to authorities while on crime scenes or as witnesses, yet paradoxically prefer posting about these same crimes on social media platforms, creating a situation where valuable intelligence exists in the digital sphere but remains inaccessible to investigators due to lack of systematic social media monitoring capabilities.

The UPF Mobile App, despite representing a technological advancement in police-citizen communication, suffers from poor public awareness and limited adoption, rendering it largely ineffective as an evidence collection or crime reporting mechanism (Kamusiime, 2018).

CCTV surveillance systems, while deployed across Kampala Metropolitan Area, face bureaucratic bottlenecks requiring extensive approval processes before investigators can access footage, causing critical delays that allow suspects to flee or evidence to deteriorate before footage review occurs (Kamusiime, 2020)

Community Policing structures, though institutionalized since 1989 through Community Liaison Officers (CLOs) and Neighborhood Watch schemes (Trojanowicz et al., 1998), struggle with limited digital integration, as CLOs lack systematic tools to capture, verify, and transmit citizen-reported social media intelligence to investigative units, creating information silos where community knowledge remains disconnected from formal investigation processes.

The combination of citizen preference for social media communication, underutilized digital platforms, bureaucratic access restrictions, fragmented community policing intelligence, and absence of systematic social media investigation frameworks creates a critical capability gap that this research addresses through development of a comprehensive, context-specific adoption framework tailored to Uganda Police Force's operational realities and resource constraints.

2.6 Research Gap

Despite growing literature on social media in law enforcement, existing frameworks focus narrowly on crime pattern analysis (Curtis-Ham et al., 2020), deterrence strategies (Braga, 2021), or automated content detection (Resende de Mendonça et al., 2020), without addressing how police organizations can systematically adopt social media as an investigative tool. While technology acceptance theories (TAM, UTAUT, IDT) explain individual adoption behaviour, they have not been applied to institutional adoption within resource-constrained police agencies in developing countries.

The specific factors affecting social media adoption; digital evidence authenticity (Angus-Anderson, 2016), cross-platform complexity (ShadowDragon, 2025), SOCMINT training needs (McAfee Institute, 2025), and privacy compliance (Gandy, 2020) have not been synthesized into a context-specific framework for African police forces. In Uganda specifically, despite citizens' preference for reporting crimes via social media (UNICEF, 2011) and the development of the UPF Mobile App (Kamusiime, 2018), no empirical research examines factors influencing Uganda Police Force's adoption of social media for crime investigation.

This research addresses this gap by developing a comprehensive, context-specific framework for social media adoption in crime investigation within the Uganda Police Force, covering pre-adoption considerations (infrastructure, legal compliance, training), adoption mechanisms (evidence authentication, cross-platform procedures, inter-agency collaboration), and post-adoption sustainability (resource allocation, performance evaluation), specifically tailored to resource-constrained police agencies in developing countries.

2.7 Conceptual framework

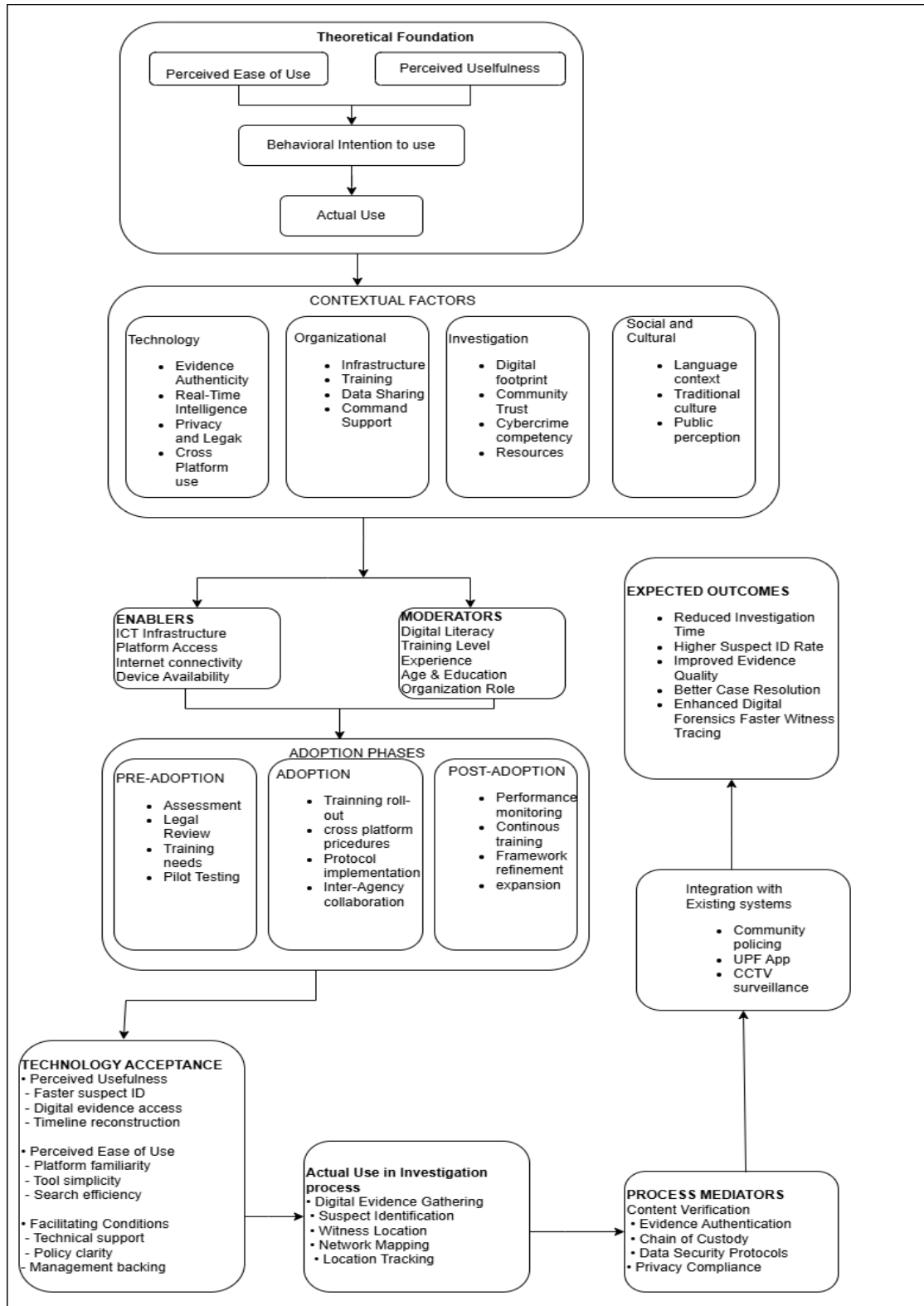


Figure 2.7 showing conceptual framework.

2.7.1 Explanation of the conceptual framework

This integrated conceptual framework, grounded in Davis's (1989) Technology Acceptance Model (TAM), maps the pathway through which Uganda Police Force can successfully adopt social media for crime investigation by demonstrating how perceived usefulness and perceived ease of use influenced by enablers (ICT infrastructure, platform access, internet connectivity) and moderated by individual factors (digital literacy, training level, experience) shape officers' behavioral intentions to use social media platforms for investigative purposes. The framework recognizes that adoption progresses through three sequential phases (pre-adoption assessment, adoption implementation, post-adoption sustainability) while being shaped by contextual factors across technology, organizational, investigation, and social-cultural dimensions that reflect Uganda's specific legal frameworks (Data Protection Act 2019, Computer Misuse Act 2011), resource constraints, and cultural realities. Behavioral intention translates into actual investigative use (digital evidence gathering, suspect identification, witness location, network mapping) which, when mediated by critical process controls (content verification, evidence authentication, chain of custody, privacy compliance), produces measurable outcomes including reduced investigation time, improved evidence quality, enhanced organizational performance, and increased community engagement. The framework ensures integration with existing Uganda Police Force systems (Community Policing structures, UPF Mobile App, CCTV surveillance) and incorporates continuous feedback mechanisms (performance metrics, user feedback, stakeholder reviews, legal audits) that enable iterative refinement, thereby addressing the identified research gap by providing comprehensive, context-specific guidance for systematic social media adoption in resource-constrained police agencies within developing countries.

2.8 Conclusion

This chapter reviewed literature on social media adoption in crime investigation, examining global and African contexts, with specific focus on Uganda Police Force's current mechanisms. The review established that while technology acceptance theories (TAM, UTAUT, IDT) explain individual adoption behavior, existing crime investigation frameworks (Curtis-Ham et al., 2020; Braga, 2021; Resende de Mendonça et al., 2020) fail to address systematic organizational adoption within resource-constrained police agencies. The identified research gap: absence of comprehensive, context-specific frameworks for social media adoption in African police forces necessitates this study's proposed integrated conceptual framework.

CHAPTER THREE

Methodology

3.0 Introduction

This chapter provides a detailed description of the selected methodology—the step-by-step methods of how the study was conducted to achieve the objectives of the research. This section comprises research design, which describes the overall strategy of the research, the participants, research instruments, approaches, processes and techniques, major data sources, data collection, analysis, and synthesis.

3.1 Research Approach

A research approach is defined as the path of conscious scientific reasoning (Peirce, 1931). The research process framework recognizes that there are three approaches that distinguish between deduction, induction, and abduction research approaches.

3.1.1 Inductive Research Approach

The inductive research approach can be expressed as the mirror image of the deductive process in that induction is aimed at creating, not testing, theory. It moves from a particular empirical case or a collection of observations to general law, i.e., from facts to theory. Empirical observations (facts) are the starting point of inductive research. As a starting point of this approach, knowledge of a general frame of literature is not necessarily needed. Instead, what is required are empirical observations about the world that lead to an emerging hypothesis and their overview through logical argumentation within a theoretical frame (Johnson, 1996; Andreewsky & Bourcier, 2000; Taylor et al., 2002; Danermark, 2001; Kirkeby, 1990)

3.1.2 Deductive Research Approach

Deductive reasoning is well-defined as a theory-testing process that instigates an established theory or generalization. It evaluates whether the theory applies to specific instances. The deductive research approach is the most prevalent research approach in scientific and logistics research. Deductive research starts with examining the theory, and then logical conclusions are derived from this theory in the form of general laws presented as ex-ante hypotheses. These are then assessed empirically (Kovacs & Spens, 2005; Danermark, 2001; Hyde, 2000; Peter & Olson, 1983; Arlbjørn & Halldorsson, 2002; Kirkeby, 1990).

3.1.3 Abductive research is a type of research that combines induction and deduction. It starts with observations but then uses those observations to form hypotheses that can be tested. For example, a researcher might observe that students who study for more extended hours tend to get better grades. The researcher might then hypothesize that there is a causal relationship between studying and grades, but they would also test other explanations, such as the possibility that students who are naturally good at school are more likely to study for longer hours.

3.1.4 Retroductive research is a type of reasoning that starts with a problem and then uses that problem to generate new theories (Jagosh, 2020). This type of research strategy is often used in

philosophy and the social sciences. For example, a philosopher might be interested in the problem of free will. The philosopher might then generate a new theory about free will by considering the diverse ways in which the problem has been conceptualized and debated. The choice of research strategy will depend on the research questions, the objectives of the research, and the resources available.

Table 3.1: summarizing research strategies

Type of research strategy	Description
Inductive research	Starts with specific observations and then builds general theories from those observations.
Abductive research	Combines induction and deduction. Starts with observations but then uses those observations to form hypotheses that can be tested.
Deductive research	Starts with a general theory and then uses that theory to make predictions about specific cases.
Retroductive research	Starts with a problem and then uses that problem to generate new theories.

3.1.5 Justification of the selected research approach

This study adopted an abductive reasoning approach, which blends inductive and deductive logic. According to Dubois and Gadde (2002), abduction allows for continuous movement between theory and empirical observations to refine understanding.

Application to the study

In this research, existing models such as TAM (Technology Acceptance Model), UTAUT, and crime-related frameworks (e.g., Curtis-Ham et al., 2020; Braga, 2021) were initially reviewed. Observations from police divisions and preliminary data (via questionnaires) informed early hypotheses about adoption barriers in investigations. These were iteratively tested and refined using further data and theoretical alignment, exemplifying the systematic combining principle of abduction.

Based on the observed gap in digital evidence collection mechanisms, a hypothesis was formed around the need for chain of custody protocols and investigator training. This was validated through survey data showing that over 80% of respondents cited lack of training and standardized procedures as critical challenges in digital investigations.

3.2 Research Methodology

Research methodology refers to the systematic approach and techniques used to conduct research, gather data, analyze information, and draw conclusions (Faryadi, 2019). It outlined the step-by-step process and procedures that a researcher follows to address the research questions or objectives effectively and to ensure the validity and Reliability of the study's findings. The research methodology acts as a roadmap that guides the entire research process, from the initial planning to the final reporting of results. The methodologies are explained below:

3.2.1 Mixed research methodology

Mixed methods research is a research approach that combines both quantitative and qualitative research methods within a single study. It involves collecting and analyzing both numerical data (quantitative) and non-numerical data (qualitative) to gain a comprehensive understanding of the research problem (Dawadi et al., 2021). By integrating the strengths of both approaches, mixed methods research aims to provide a more complete and balanced analysis of complex phenomena than using either method alone. It is particularly valuable for studying complex research questions that require a comprehensive understanding, addressing various aspects of the research problem, and validating or enriching quantitative findings with qualitative insights and development.

3.2.2 Design Science

Design Science is a research methodology used in the field of information systems, computer science, and engineering. It is based on the idea that researchers can create and evaluate artifacts (e.g., systems, models, algorithms) to address specific problems or challenges (Vom Brocke et al., 2020). The focus is on designing and building innovative solutions to practical problems. The research process involves identifying a problem, designing a solution, implementing the artifact, and evaluating its effectiveness. Design Science research often follows a problem-solving approach, aiming to contribute not only to theory but also to the development of practical applications and solutions (Vom Brocke et al., 2020).

3.2.3 Action research

Action research is a collaborative and participatory research methodology aimed at addressing real-world problems within specific contexts. It involves close engagement with stakeholders to identify issues, develop interventions, and effect positive change (Erro-Garcés & Alfaro-Tanco, 2020). Through iterative cycles of data collection, analysis, intervention, and reflection, action research seeks to bridge the gap between theory and practice, generating practical solutions while contributing to academic knowledge (Ronen, 2020). Ethical considerations are integral to the process, ensuring respect for participants' rights and confidentiality. By actively involving stakeholders, action research creates opportunities for meaningful and sustainable improvements in various fields, including education, social work, healthcare, and community development.

3.2.4 Participatory research methodology

Participatory research is a collaborative and empowering methodology that involves active engagement between researchers and the community or participants under study. This approach seeks to create meaningful and relevant knowledge by involving those affected by the research in all stages of the process. It emphasizes co-learning, shared decision-making, and action, aiming to address practical issues and promote social change.

In participatory research, participants contribute their insights, experiences, and perspectives, leading to a more holistic understanding of the research topic. This methodology takes various forms, including community-based participatory research (CBPR) and participatory design. By valuing local knowledge and sharing power, participatory research facilitates the co-creation of solutions, empowers marginalized groups, and leads to insights that are deeply connected to the

realities of the community. It is particularly effective for studying complex social issues and fostering sustainable change through collaborative efforts.

3.3 Research Strategy choice

In this study, Design Science Research (DSR) was adapted to the study. The primary objective of the study was to create an artifact in the form of a framework for the adoption of social media in crime investigation. DSR supports the creation of artifacts or new knowledge and structures the research process in a logical way, hence achieving the proposed objectives (Peppers et al., 2007; Hevner et al., 2004). Various scholars have forwarded different approaches to design science in a bid to advance the work of Hevner et al. (2004), and these include Baskerville, Pries-Heje, and Venable (2009). Offerman et al. (2009), Salvatore, March & Storey (2008), Peppers et al. (2007), Gregor & Jones (2007), and Vaishnavi & Kuechler (2004), among others. For purposes of this research, the design science research process or guidelines forwarded by Hevner et al. (2004) were used because of their suitability for research in the field of information systems.

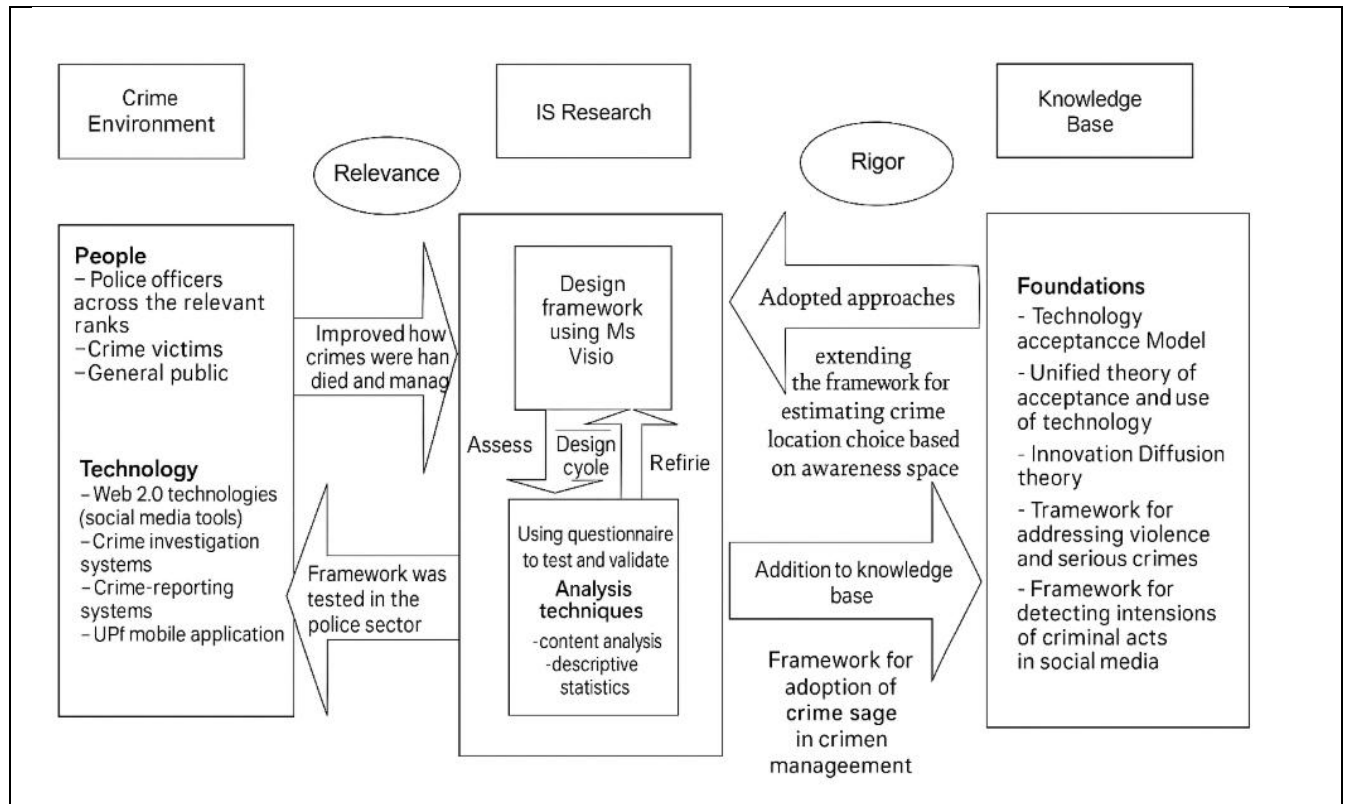


Figure 3.1: Adapted methodology based on (Hevner et al., 2004; Hevner, 2007)

3.3.1 Justification of the research study

Design Science Research methodology was selected as the most appropriate approach for this study due to its fundamental alignment with the research objectives and deliverables. This methodology excels in contexts requiring the creation of practical, implementable solutions, specifically, the development of a social media adoption framework for the Uganda Police Force rather than merely describing existing phenomena. The research problem inherently demanded an actionable artifact

capable of addressing functional deficiencies in current crime investigation practices, particularly the ad hoc and unsystematic utilization of social media platforms for evidence gathering and suspect identification. Design Science Research's iterative build-and-evaluate cycle provided the necessary methodological rigor to ensure the proposed framework underwent systematic validation through expert reviews, pilot testing, and empirical assessment against established criteria of utility, feasibility, and effectiveness. Furthermore, this methodology's dual emphasis on theoretical contribution and practical utility aligned perfectly with the study's ambition to advance academic understanding of technology adoption in law enforcement contexts while simultaneously delivering an implementable solution that Uganda Police Force leadership could operationalize to enhance investigative capabilities.

3.3.2 Relevance Cycle

The Relevance Cycle focused on establishing the importance and significance of the research problem. It started with **problem identification and motivation**, where the researcher identified a real-world problem requiring a solution.

3.3.2.1 Data Collection Methods and Instruments

The data collection methods and instruments for this study included semi-structured online questionnaires, and document analysis. These methods were chosen because they allowed the researcher to gather in-depth, detailed information about issues affecting adoption of social media in crime investigation within the Uganda police force. The tools were therefore explained below.

A well-structured questionnaire was used to capture responses from respondents. The questionnaire was used because respondents could complete it anonymously, and it was cost-effective while reaching a larger sample (Robson, 2002). The questionnaire was administered online to ensure wider coverage, cost-effectiveness, and anonymity of responses. The questionnaire was then distributed through multiple channels. Primarily, links to the questionnaire were shared via official police communication networks, and secured WhatsApp groups used by officers across the Kampala Metropolitan divisions. This approach allowed respondents to complete the survey at their convenience while maintaining confidentiality. The online method further reduced logistical costs associated with physical distribution and ensured that the questionnaire could reach a larger sample across different divisions without geographical limitations.

Document Analysis:

The study drew upon multiple documentary sources to establish contextual understanding and empirical grounding for the research problem. Uganda Police Force annual crime reports spanning 2021 to 2024 provided quantitative data on crime trends, case resolution rates, investigative challenges, and existing technology utilization patterns, enabling identification of performance gaps that social media adoption might address. Existing ICT policies, including internal directives, standard operating procedures, and technology governance frameworks, were analysed to understand the current regulatory environment, identify policy gaps regarding

social media use in investigations, and assess organizational readiness for digital innovation. Investigation case files, both successful prosecutions and unresolved cases were examined to document current investigative practices, identify instances where social media evidence was utilized or could have been valuable, and understand practical barriers officers encounter when attempting to leverage digital platforms. Additionally, relevant academic literature on technology adoption in law enforcement and grey literature including international best practice guidelines, law enforcement agency reports, and digital investigation manuals provided comparative context, theoretical foundations, and insights into successful implementation strategies employed in similar jurisdictions. Collectively, these documentary sources triangulated evidence regarding the current state of crime investigation in Uganda, validated the practical significance of the research problem, informed framework design decisions, and established baseline metrics against which the proposed artifact's potential impact could be assessed.

3.3.2.2 Study population

The study population encompassed diverse stakeholder groups and geographical units to ensure comprehensive representation of perspectives relevant to social media adoption in crime investigations. At the individual level, the population included Criminal Investigation Department (CID) officers who conduct felony investigations, crime scene investigators responsible for evidence collection and preservation, IT staff within police divisions who manage technological infrastructure, officers specifically handling digital evidence who possess specialized technical competencies, social media users who have reported crimes and could provide victim/witness perspectives on digital engagement with law enforcement, experts in crime investigations who offer technical and procedural insights, and policymakers in law enforcement whose strategic decisions shape technology adoption trajectories. Geographically, the study population comprised 18 police divisions within the Kampala Metropolitan Area of Uganda, distributed across three regions: five divisions from Kampala East, seven divisions from Kampala North, and six divisions from Kampala South. This metropolitan focus was strategically justified given Kampala's concentration of both crime incidents and technological infrastructure, with Old Kampala division—one of the selected divisions reporting the highest crime rate of 4,314 cases in 2022 according to Uganda Police crime statistics—exemplifying the operational environment where social media adoption could yield significant investigative benefits. This multi-level population design enabled examination of social media adoption from operational, technical, organizational, and policy perspectives while capturing geographical variation in crime patterns, resource availability, and implementation contexts across the metropolitan region.

3.3.2.3 Sample Size

Kish Leslie's formula was used to calculate the sample size. Thereby, n

$$= \frac{Z^2 P (1-P)}{d^2}$$

Where:

n = is the required Sample Size

Z = 1.96, the standard normal distribution.

P is the Prevalence of Crime/crime rate in Uganda (0.1%) according to a study done in 2021 (Uganda Police Force Annual Crime Report, 2021)

d = 0.05, the desired level of precision

$n = 1.96^2 * 0.1 * (1 - 0.1) / 0.05^2$ $n = 0.196$

$(1 - 0.1) / 0.0025$ $n = 0.196(0.9) / 0.0025$

$n = 70.56$ $n = 71$

Therefore, the sample size was 71 respondents. For purposes of sample attrition, 10% was added to make 78 respondents.

3.3.2.4 Sample procedure

The sampling strategy for this study was **purposive sampling**, which involves selecting a sample based on the expertise or experience of individuals rather than random selection (Creswell, 2014). This sampling technique was used because the research focused on understanding the potential for implementing a framework for the adoption of social media in crime investigations. Sampling strategy ensured that participants possessed the contextual expertise, technical competence, and practical experience necessary to provide credible, nuanced data regarding factors influencing social media adoption and its impact on investigative outcomes within the Uganda Police Force context.

3.3.3 Design Cycle

The Design Cycle was centred around the creation of an artifact that served as a solution to the identified problem. It began with **artifact design**, where the researcher designed and developed the framework for adoption of social media in crime investigations.

Activities in Design Cycle:

Artifact Design: The framework development process followed Design Science Research's systematic artifact creation methodology, encompassing three interconnected stages that ensured both theoretical rigor and practical applicability. The artifact design phase involved constructing a comprehensive framework architecture organized around three phases (pre-adoption, adoption, post-adoption phases)

Artifact Justification: Artifact justification provided explicit theoretical rationale for each design decision, grounding framework components in established theories including the Technology Acceptance Model for understanding officer perceptions, UTAUT for organizational implementation factors, Crime Pattern Theory for criminological validity, and Innovation Diffusion Theory for change management strategies, thereby ensuring that the framework represented theoretically-informed prescriptive knowledge rather than ad hoc recommendations

Iterative Refinement: The iterative refinement stage operationalized Design Science Research's build-evaluate-refine cycle through multiple revision rounds incorporating feedback from diverse

stakeholders: expert reviews from senior investigators identified operational feasibility concerns, pilot testing with frontline officers revealed usability issues and implementation barriers, consultations with legal advisors ensured regulatory compliance, and validation sessions with IT personnel confirmed technical viability. This iterative approach enabled progressive enhancement of the framework's utility, feasibility, and effectiveness, transforming initial conceptualizations into a refined artifact capable of addressing the complex socio-technical challenges inherent in introducing social media investigation capabilities within the Uganda Police Force's organizational and infrastructural context.

3.3.4 Rigor Cycle

The Rigor Cycle emphasized the importance of conducting research in a rigorous and methodologically sound manner. It started with research rigor, where the researcher followed established research methods, frameworks, and practices (Hevner et al., 2010). Rigor was crucial for ensuring the validity and Reliability of the research outcomes. The cycle then moved to artifact efficacy and quality, where the researcher validated the artifact's efficacy through a structured walk-through evaluation method (Hevner et al., 2010). This involved testing the artifact in controlled environments to ensure it functions as intended and provides value. The Rigor Cycle underscored the need for research integrity and the systematic validation of the proposed artifact (Hevner et al., 2010).

In this study, the researcher reviewed literature and related research theories and frameworks regarding crime investigations. A review of existing theories and frameworks was conducted with the aim of finding out the major gaps in existing literature and frameworks to find a solution framework that addressed the identified issues. Therefore, under this cycle, our third specific objective was achieved, which also answered our third research question. The following activities were done under the artifact efficacy and quality.

3.3.4.1 Data analysis

After collecting the data using a pre-coded questionnaire, it was edited for inconsistencies. Statistical Package for Social Scientists (SPSS) version 20.0 was used for data entry and analysis. The data was then presented in tabular and graphical formats for easy visualization of the results.

3.3.4.2 Validity

Validity is the ability to produce findings that agree with theoretical or conceptual values (Dawson, 2002). Supervisors proofread the research instruments to establish their face validity. The researcher ensured that the questions were relevant through calculation of the **Content Validity Index (CVI)**.

CVI Calculation:

$CVI = \text{Number of items rated relevant} / \text{Total number of items}$

A CVI greater than 0.7 indicates valid content (Krishnaveni & Ranganath, 2011)

3.3.4.3 Reliability

Reliability is the measure of the degree to which the research instrument yields consistent results after repeated trials (Saunders et al., 2009). Reliability was assessed using **Cronbach's coefficient alpha** for the questionnaire instrument.

Acceptable Reliability Threshold:

Cronbach's $\alpha \geq 0.7$ indicates acceptable reliability (George & Mallery, 2003)

3.3.4.4 Framework Validation

Framework validation encompassed a series of activities aimed at assessing the accuracy, reliability, and relevance of the conceptual framework used in the research process. To ensure the robustness and validity of the proposed framework, a comprehensive validation process was undertaken:

Validation Methods:

Structured Walkthroughs: The research framework underwent rigorous validation through structured expert review sessions with key stakeholders across multiple domains. Crime investigation experts and senior investigators provided critical insights into the practical applicability of the framework within operational policing contexts, ensuring alignment with investigative workflows and evidentiary requirements. Social media experts evaluated the technical feasibility and platform-specific considerations for evidence collection and digital forensics. IT managers assessed the technological infrastructure requirements, security protocols, and system integration capabilities necessary for implementation. Policymakers examined the framework's compliance with legal and regulatory requirements, including data protection laws, privacy considerations, and institutional policies governing digital evidence handling. These multi-perspective reviews ensured the framework's comprehensive relevance, practical viability, and institutional acceptability across technical, operational, and policy dimensions within the Uganda Police Force context.

Validation Questionnaire: Using Likert-scale questions to capture importance ratings for each component.

3.4 Inclusion and exclusion criteria

3.4.1 Inclusion Criteria

The research employed purposive sampling to select participants who met specific inclusion criteria essential for meaningful data collection and framework validation. Eligible respondents were actively involved in criminal investigation activities within the Uganda Police Force, ensuring they possessed firsthand experience with investigative processes and challenges. Participants demonstrated either practical experience with digital investigation methods or expressed professional interest in leveraging technology for criminal investigations, positioning them to provide informed perspectives on social media adoption. Familiarity with social media platforms was mandatory, as participants needed to understand the capabilities, limitations, and evidentiary potential of these digital tools. Geographically, the study focused

exclusively on personnel working within the Kampala Metropolitan Area police divisions, providing contextual consistency, and addressing the urban crime investigation landscape where social media usage is most prevalent. Finally, all participants were required to provide informed consent by signing the Consent Letter, ensuring ethical compliance, voluntary participation, and acknowledgment of their rights regarding confidentiality, data protection, and withdrawal from the study at any point without consequence.

3.4.2 Exclusion Criteria

The study established clear exclusion criteria to ensure data quality, ethical integrity, and relevance to the research objectives. Personnel with no involvement in investigation activities were excluded, as they lacked practical experience and contextual understanding necessary to provide meaningful insights into the adoption and application of social media tools for crime investigations. Individuals with health complications that would prevent their full participation were excluded on ethical and practical grounds, ensuring that no participant's well-being was compromised and that data collection occurred under appropriate conditions. Potential participants who declined to take part in the research were respected and excluded in accordance with ethical principles of voluntary participation and informed consent, with no pressure or coercion applied to secure their involvement. Finally, investigators not based in the Kampala Metropolitan Area were excluded to maintain geographical focus and contextual consistency, as the framework was specifically designed to address urban crime investigation challenges within this defined operational environment where social media penetration and usage patterns are most relevant to the study's scope.

3.5 Limitations to the Study

Some respondents were reluctant to answer all questionnaire items due to the sensitive nature of crime investigation information and concerns about operational security breaches. Constant monitoring by researchers during data collection sessions, coupled with assurances of confidentiality and institutional approval from Uganda Police Force, helped mitigate this problem and improved response rates.

Financial and time restrictions posed challenges for extensive data collection across multiple police divisions and prolonged engagement with expert review participants. These constraints were managed through meticulous planning, strict budget adherence, and strategic prioritization of the Kampala Metropolitan Area where the highest concentration of specialized investigative units (CID, Counterterrorism, Cybercrime Unit) is located.

Investigation-related information, particularly concerning ongoing cases, surveillance techniques, and inter-agency collaboration protocols, was difficult to obtain from police personnel due to legitimate confidentiality and national security considerations. Respondents were assured of complete anonymity through informed consent procedures, personal identifiers were not collected, and all data was aggregated to prevent identification of individual officers or specific operational details.

Limited Sample Size While the sample size of 78 respondents was statistically sufficient for the study's objectives and achieved adequate representation of crime investigation professionals and IT managers, the geographic focus on Kampala Metropolitan Area limits generalizability to other Uganda Police divisions in rural or less-resourced regions. Future research should expand the framework validation to include regional police commands in Gulu, Mbarara, Jinja, and other divisions to assess contextual variations in adoption factors.

Technology Literacy Variance Varying levels of digital literacy among investigators, ranging from basic computer skills to advanced SOCMINT capabilities, affected the depth and technical sophistication of responses regarding social media investigation techniques, cross-platform analysis, and digital forensics procedures. This variance necessitated careful interpretation of responses and triangulation with expert interviews to ensure accurate understanding of technological capabilities and constraints within Uganda Police Force.

3.6 Ethical Considerations

The researcher emphasized complete confidentiality of all research findings and deployed research assistants during data collection sessions where bias was anticipated, particularly when interviewing senior officers or discussing contentious organizational issues.

All participants were comprehensively informed about the study's purpose, objectives, data collection procedures, and intended use of findings, with voluntary consent obtained through signed consent forms without coercion or institutional pressure.

Respondents' names, police identification numbers, and other personal identifiers were deliberately excluded from all research instruments to protect participants' identities, particularly crucial in hierarchical police organizations where officers might fear repercussions for expressing critical views.

All collected data was kept strictly confidential and used exclusively for research purposes, with assurances that individual responses would not be shared with Uganda Police Force leadership and that aggregated findings would prevent identification of specific respondents.

Electronic data files were password-protected using encryption standards and stored on secure, access-restricted devices, while physical documents were securely stored in locked cabinets accessible only to the researcher.

Participants were explicitly informed of their unconditional right to withdraw from the study at any time without justification or negative consequences such as disciplinary action or career disadvantage within Uganda Police Force.

3.7 Conclusion

The major aim of this research was to design a framework for the adoption of social media in crime investigations. Design Science Research methodology was adopted throughout the research process because it supports the creation of artifacts/new knowledge and structures. Abductive research strategy helped in systematic carrying out of research by allowing iteration between theory and empirical observations. The next chapter presents findings from the data collection process.

CHAPTER FOUR

Presentation and Discussion of Findings

4.0 Introduction

This chapter presents a detailed discussion of findings obtained from the survey in relation to the research questions. The study considered 18 police divisions in metropolitan Kampala: investigators, IT professionals, and crime experts. The data was collected and analyzed using SPSS (version 20) and content analysis.

The findings presented helped the researcher achieve **Objective 1**: To determine the requirements for development of a framework for the adoption of social media in crime investigations, thereby answering **Research Question 1**: What are the requirements needed to develop a framework for the adoption of social media in crime investigations?

4.1 Presentation of study findings

This section presents findings obtained from analyzing data collected from the respondents. A total of **101 participants** responded to the survey as opposed to the sample of 78 desired. This gave a response rate of **129.5%**. Descriptive statistics were used to present and explain the findings.

4.1.1 Sample Characteristics

Table 4.1: Table showing sample characteristics.

Demographic Item	Category	Percentage (%)
Gender	Male	68.4
	Female	31.6
Age	26- 30 years	57.0
	31 – 35 years	20.3
	Above 36 years	22.7
Work Experience	0 -5 years	48.1
	6 -10 years	31.6
	11 -15 years	17.7
	Above 36 years	2.6
Education Level	Bachelor's degree	64.6
	Master's degree	29.1
	Diploma	3.8
	PhD	1.3

4.1.2 Respondent categories

Table 4.1.1: Table showing the respondent categories.

Category	Percentage (%)
Crime victims	15
Crime investigators	35
Police official	30
Policy maker	1
IT manager	1
CCTV Analyst	5
Social media experts	3
Others	11

4.1.3 Length of use of social media

The results presented in figure 4.2 below revealed that 62% of the respondents have used social for more than 8 years, 8.9 % between 6-8 years of use, 22.8 % between 4-6 years of use, 3.8% between 2-4 years and 2.5 % between 0-2 years. It can be concluded that majority of the respondents have used ICTs and could easily interpret questions about ICT.

Interpretation: Most respondents (62%) have used social media for more than 8 years, indicating high familiarity with technology that can be leveraged for digital investigations.

Table 4.1.2: Length of use of social media

Years of Social Media Use	Percentage (%)
0 - 2 years	3.2
2 - 4 years	3.0
4 - 6 years	22.8
6 - 8 years	8.9
Above 8 years	62.0
Total	100.0

4.1.4 Formal training of social media for crime investigations

The results presented in the figure below showed 93.7% of the respondents had formal training about social media related platforms and equipment. 6.3% of the respondents indicated they did not have any training. This implies that majority of the respondents were in position to understand the questions presented.

Interpretation: The overwhelming majority of respondents had formal training, suggesting a solid foundation for adopting social media tools in investigations.

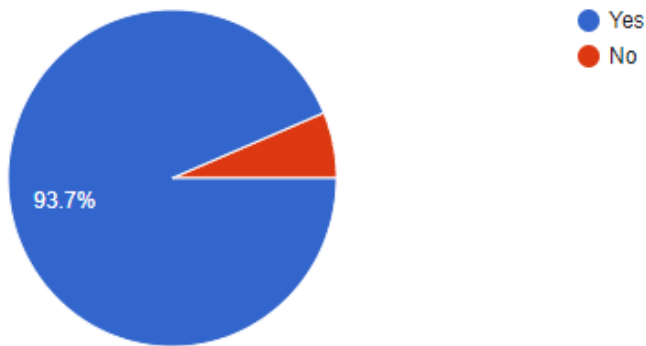


Figure 4.1 showing if users have used social media for crime investigations.

4.1.5 Access to social media platforms

The results presented in the figure below showed that 82.5% of the respondents used mobile phones, 77.5% used personal laptops/desktops and 70 % used company laptop /desktop to access social media related platforms. This implies that most of the users can easily access any ICT related platforms.

Interpretation: Multiple access points indicate readiness for digital investigation activities across various devices.

Table 4.1.3: How do users access social media

Device Type	Percentage (%)
Mobile phones	82.5
Personal laptops/desktops	77.5
Company laptops/desktops	70.0

4.1.6 Social media Use in Investigations

The results showed that 73.8% of the respondents indicated that social media was used in investigating and reducing criminal activity, 16.2% that social media has been used and 10 % disagree that social media has been used in investigations. The table below shows the ways in which criminal activity has been managed and reduced.

Interpretation: While ICTs are being used, social media for investigations accounts for only 14.9%, indicating significant room for growth.

Table 4.1.4: Table showing the various Technologies used to investigate criminal activity.

Item	Frequency	Percentage
CCTV	40	39.6%
Mobile Phones	8	7.9%
Criminal reports	5	4.9%
Cellular tracking technologies	1	1%
Intrusion detection/Facial recognition systems	4	3.9%
Social media awareness	15	14.9%
Using Experts/professionals/companies	12	11.9%
Using UPF Application	7	6.9%
Alarm systems	3	2.9%
No response	6	6%

4.1.7 Social media application use

The results showed that 100% of respondents used WhatsApp. This was the most used application, Facebook (83.1%), TikTok (65.3%), Instagram (68.3%), YouTube (87.1%), Snapchat (20.7%), X (26.7%), LinkedIn (22.8%), Skype, Telegram, Threads all tied at 20.7%.

Interpretation: Universal WhatsApp usage (100%) and high Facebook usage (83.1%) indicate these platforms are most familiar to investigators and could be prioritized for investigative adoption.

Table 4.1.5 showing social media application usage.

Social media tool	count	Percentage
WhatsApp	101	100
Facebook	84	83.1
TikTok	66	65.3
LinkedIn	23	22.8
Instagram	69	68.3
YouTube	88	87.1
Skype	21	20.7
Telegram	21	20.7
Snapchat	21	20.7
X	27	26.7

4.1.8 Frequency of use of social media

The findings presented below showed that 50 % of the respondents always used social media applications, 27.5 % of the respondents often used social media, 15% of them showed that they occasionally used social media and 7.5 % of the respondents used social media sometimes. This showed that most of the respondents used social media most of the time.

Interpretation: 77.5% of respondents use social media always or often, demonstrating regular engagement with platforms that could be leveraged for investigations.

Table 4.1.6: Frequency of use

Frequency of Social Media Use	Percentage (%)
Always	50.0
Often	27.5
Occasionally	15.0
Sometimes	7.5
Total	100.0

4.1.9 Measure of Adoption factors in relation to TAM

Note: Scale: 5=Strongly Agree (SA), 4=Agree (A), 3=Neutral (N), 2=Disagree (D), 1=Strongly Disagree (SD)

Table 4.1.7: Technology Acceptance Constructs for Social Media in Crime

ITEM	MEAN	S.Dev	SA (%)	A (%)	N (%)	D (%)	SD (%)
Perceived Usefulness							
Using social media for crime investigation would reduce time lags in disseminating information to the public	4.26	0.72	50.5	39.6	6.9	2.0	1.0
Using social media for crime investigation would improve how crimes are handled	3.93	0.91	37.6	39.6	13.9	5.0	4.0
Is social media usage faster in dissemination of information about criminal activity to the public	4.00	1.02	36.6	42.6	9.9	8.9	2
Perceived Ease of Use							
Would social media platforms be easily used to manage crimes	3.62	1.15	27.7	34.7	13.9	16.8	6.9
It is easy to interact with social media while managing crimes	3.79	0.89	27.7	41.6	22.8	6.9	1.0
I would find it easy to retrieve criminal data on social media	3.78	0.93	29.7	39.6	18.8	8.9	3.0
Behavioral Intention							
I intend to use social media for crime investigation regularly	3.74	0.95	29.7	37.6	22.8	6.9	3.0
I think I would like to use social media for crime investigation always	3.67	1.08	30.7	30.7	22.8	11.9	4.0

Using social media for crime investigation would help me become skillful in managing criminal activities	3.66	1.01	25.7	39.6	20.8	9.9	4.0
Facilitating Conditions							
My interaction with use of social media for crime investigation would become clear and understandable	4.05	0.78	37.6	48.5	9.9	4.0	0.0
Using social media will allow police to follow up on regular updates to the public	4.24	0.82	50.5	37.6	8.9	3.0	0.0
The use of social media in crime investigation will assist in rapid retrieval of criminal information	3.76	1.09	34.7	32.7	16.8	11.9	4.0

Table 4.1.8: Satisfaction and Confidence in Social Media Use for Crime

ITEM	MEAN	S.Dev	SA (%)	A(%)	N(%)	D(%)	SD(%)
How satisfied are you with current social media usage for crime investigation	2.98	0.93	4.0	18.8	39.6	29.7	7.9
I feel very confident in using social media for crime investigation	3.43	0.99	16.8	41.6	23.8	13.9	4.0
Using social media for sharing information to the public is very quick and reliable	3.48	1.20	30.7	30.7	15.8	15.8	6.9
I am satisfied in using social media platforms to manage criminal activities	3.62	0.92	18.8	46.5	18.8	11.9	4.0
Self-reported social media literacy	4.22	0.98	41.6	41.6	0.0	11.9	5.0

4.1.9 Attributes capturable via social media.

The findings presented in the table below indicated the measure of the following attributes in relation to them being captured and managed using social media.

Interpretation: High agreement across all investigative attributes (76.2% - 95%) validates that social media can capture critical crime pattern factors identified by Curtis-Ham et al. (2020): location, frequency, duration, timing, and behavioral patterns

Table 4.1.9 Attributes that can be captured and measured using social media.

Attribute	Yes (count)	No (count)
Duration of crime	87	14
Timing	77	24
Location	96	5
Frequency	84	17
Behavior of the offender	87	14
Witness availability	86	15
Opportunity	78	23
Knowledge of crime	84	17

4.2 Benefits, Challenges and Methods

4.2.1 Methods used currently

This section presents the current primary methods used in crime Investigations. The figure below shows that 63.7% of the respondents used data analysis, 56.3% used community policing, 81.3 % used surveillance, informants were 61.3%, social media was 45%, Training and Siems were at 1.3%.

Interpretation: While 81.3% use surveillance and 63.7% use data analysis, only 45% use social media for investigations, indicating underutilization despite availability.

The figure below gives an illustration to this.

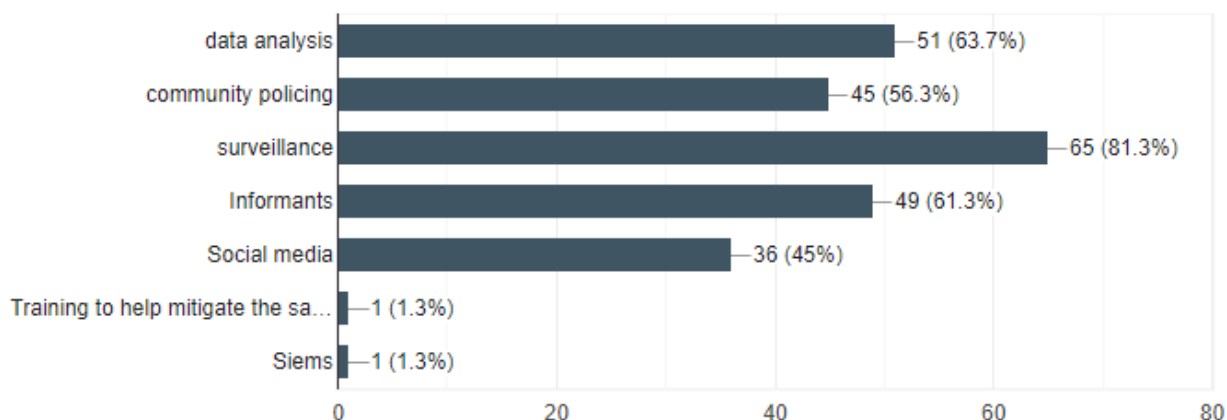


Figure 4.2.1: primary methods of crime investigations.

4.2.2 Benefits of using social media for crime Investigations.

The figure below illustrates the assumed benefits of using social media for crime investigations. Faster community engagement gave a response rate of 82.5%, faster dissemination of information to the public gave a response of 87.5%, public awareness was 86.3%, crime reporting gave 61.3%, real time data was 66.3% while data analysis, recognition and faster crime investigations gave a response rate of 55%.

Interpretation: High recognition of benefits (55% to 87.5%) contrasts with low current usage (45%), indicating **implementation barriers** rather than lack of perceived value.

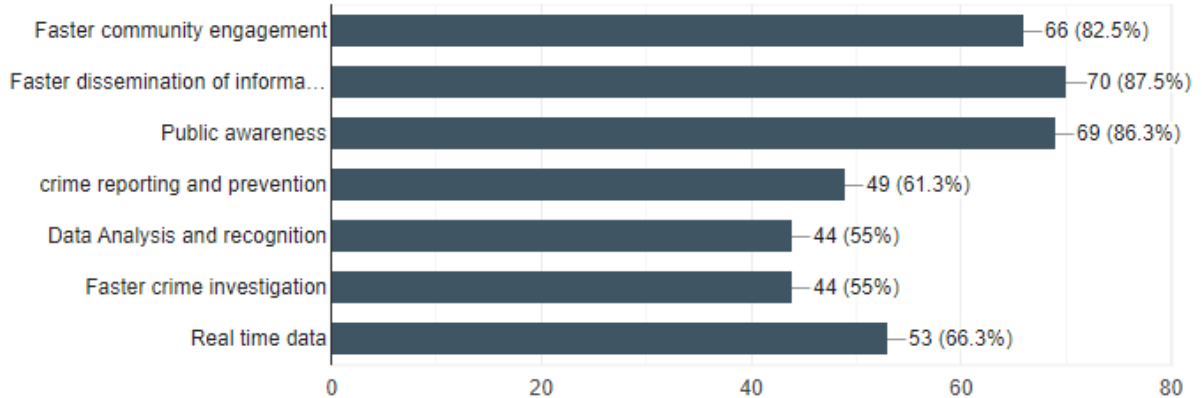


Figure 4.2.2: Benefits of using social media for crime investigations.

4.2.3 Challenges Identified

Findings presented in the figure below revealed the challenges that have hindered the adoption of social media in crime investigations. The challenges have been assigned codes C1 – C9.

Interpretation: The top three challenges are:

Privacy and data security (85%): Investigators concerned about protecting witness identities, handling sensitive evidence.

Misinformation (81.3%): Difficulty verifying authenticity of social media content.

Legal issues (58.8%): Uncertainty about admissibility of social media evidence in court

These challenges directly informed requirements derivation (Section 4.5).

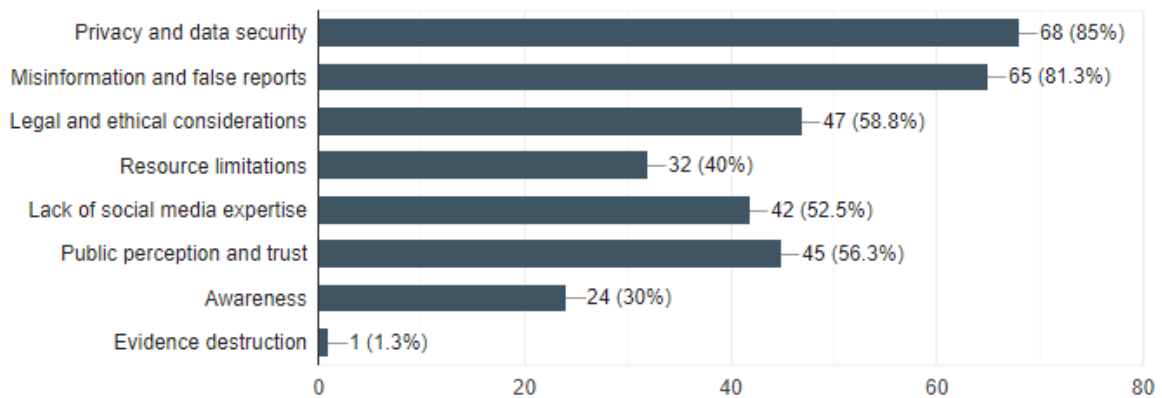


Figure 4.2.3: Challenges that hindered the adoption of social media in crime investigations.

4.2.4 Content Verification

This section revealed the various measures of how social media content is verified. See the table below for more illustration.

Interpretation: While 68.3% use multi-source verification, methods are informal and unstandardized. This validates the need for Requirement R3: Establish content verification strategies.

Table 4.4: showing how content is verified.

Item	count	Percentage (%)
Verification	69	68.3
Cross checking/ witness availability	10	9.9
Watermarks / signatures	7	6.9
Not sure	4	3.9
Audits	8	7.9
QR codes	1	0.9
Licenses	2	1.9

4.3 Requirements for the adoption of social media in crime Investigations

Determining the requirements was a major objective of the study. The challenges (C) presented in Section 4.3 were translated into requirements (R) as shown below.

Table 4.5: showing derived requirements (primary data)

Code	Challenges (C)	Code	Derived Requirements
C1	Privacy and data security issues	R1	Establishment of security and privacy guidelines, regulations, and policies for digital evidence
C2	False reports and misinformation	R2	Establishment of the adoption strategy
		R3	Establishment of content verification strategies
C3	Legal and ethical issues	R4	Establishment and alignment of Business process with social media act and computer misuse act 2011
		R5	Establishment of ethical guidelines
C4	Resource limitations	R6	Establishment of Resource planning and allocation strategies
C5	Limited social media experts	R7	Establishment of Consultation and training programs
C6	Public perception and trust issues	R8	Engagement of stakeholders and community
C7	Low awareness	R9	Establishment of awareness strategies and campaigns
C8	Evidence destruction	R10	Seeking Government support and top management
		R11	Establishment of secure Content storage and management strategies
C9	Lack of investigative protocols	R12	Establishment of training sessions and protocols

R1: Establishment of Security and Privacy Guidelines for Digital Evidence This requirement addresses the critical concern of privacy and data security issues, which 73.7% of respondents identified as a primary challenge, necessitating establishment of comprehensive security protocols to protect witness and victim identities in social media evidence, safeguard sensitive investigative intelligence, maintain digital evidence integrity, and ensure compliance with data protection regulations through implementation of data encryption standards for digital evidence, access control protocols, secure storage systems, and privacy impact assessments (Rygielski et al., 2002; Angus-Anderson, 2016; Electronic Frontier Foundation, 2025; Gandy, 2020).

R2: Establishment of the Adoption Strategy for Social Media in Investigations Addressing the challenge of false reports and misinformation, which concerned 69.3% of respondents, this requirement involves developing a comprehensive strategic plan that defines the goals and objectives of social media adoption in investigations, outlines clear timelines for implementation,

establishes key performance indicators (KPIs) for measuring investigative effectiveness, and details resource allocation plans through careful pilot program design, phased rollout strategy, establishment of success metrics such as case resolution time and suspect identification rates, and comprehensive risk mitigation plans (Davis, 1989; Venkatesh et al., 2003; Rogers, 2003; Policing Bureaucracy Task Force, 2005).

R3: Establishment of Content Verification and Authentication Strategies This requirement addresses the critical need for standardized methods to verify the authenticity of social media content used as evidence, directly responding to concerns about false reports and misinformation identified by 69.3% of respondents, demanding establishment of multi-source verification protocols, deployment of digital forensics tools for comprehensive metadata analysis, application of advanced image and video authentication techniques, development of expert consultation procedures, and creation of rigorous documentation standards for the verification process (Angus-Anderson, 2016; Bosco Legal, 2024; SMI Aware, 2025; PageFreezer, n.d.; VIDIZMO, 2025).

R4: Establishment and Alignment of Investigative Processes with Legal Frameworks Responding to legal and ethical concerns raised by 65.8% of respondents, this requirement ensures that all investigative procedures fully comply with Uganda's Computer Misuse Act 2011, Social Media Act, Evidence Act, and Data Protection and Privacy Act through comprehensive legal review of all investigative protocols, establishment of proper chain of custody procedures for digital evidence, development of clear admissibility guidelines for social media evidence in court proceedings, and creation of streamlined procedures for obtaining digital warrants (Gandy, 2020; Congressional Research Service, n.d.; Electronic Frontier Foundation, 2025; Brennan Center for Justice, n.d.).

R5: Establishment of Ethical Guidelines for Digital Investigations This requirement involves developing comprehensive ethical principles to guide surveillance and monitoring of suspects, regulate the use of undercover accounts, establish protocols for handling private communications, and ensure protection of innocent third parties whose information may appear in social media evidence through establishment of an ethics review board, development of guidelines ensuring proportionate surveillance that respects individual rights, creation of protocols specifically designed to protect uninvolved individuals, and comprehensive training programs on ethical decision-making in digital investigation contexts (Ferguson, 2017; Marx, 2013; Brookings Institution, 2020; Yale Journal of Law & Technology, n.d.).

R6: Establishment of Resource Planning and Allocation Strategies Responding to resource limitations identified as a concern by 52.5% of respondents, this requirement addresses the strategic allocation of personnel through dedicated digital investigation units, technology including necessary software, hardware, and connectivity infrastructure, adequate budget for tools and training programs, and sufficient time allocation for investigators to conduct thorough digital investigations through comprehensive needs assessment, strategic budget allocation, efficient

procurement processes, and thoughtful staffing plans (Huang & Chuang, 2007; Hu et al., 2005; Braga, 2021; Policing Bureaucracy Task Force, 2005).

R7: Establishment of Consultation and Training Programs for Investigators This requirement addresses skill gaps identified by 38.9% of respondents who cited limited social media expertise as a concern, necessitating establishment of comprehensive training programs including initial training for investigators on various social media platforms, advanced training on open-source intelligence (OSINT) techniques, professional certification programs in digital investigations, and continuous professional development opportunities through systematic training curriculum development, engagement of external experts, practical sessions simulating real investigation scenarios, and regular refresher courses covering emerging platforms and techniques (McAfee Institute, 2025; Bureau of Police Research and Development, India, 2022; Datastat Training Institute, 2025; Blue to Gold, 2025; Protective Intelligence Network, n.d.).

R8: Engagement of Stakeholders and Community in Investigative Processes This requirement involves building trust and fostering collaboration with community members who provide valuable investigative tips, social media platform companies that control access to data, civil society organizations that advocate for rights protection, and media partners who can amplify public awareness through community sensitization programs, establishment of feedback mechanisms, promotion of transparency in digital investigation practices, and development of formal partnerships with platform providers (Meijer & Thaens, 2013; Ferguson, 2017; Bertot et al., 2012; Ghobakhloo et al., 2011).

R9: Establishment of Awareness Strategies and Campaigns Responding to low awareness levels identified by 48.7% of respondents, this requirement addresses both public and internal awareness about how citizens can effectively report crimes via social media, what specific information proves most useful for investigations, what privacy protections are in place, and documented success stories through comprehensive public awareness campaigns utilizing multiple communication channels, internal communication strategies, strategic media engagement, and systematic documentation of success cases (UNICEF, 2011; Kamusiime, 2018; Community Oriented Policing Services, 2013; Deneff et al., 2013).

R10: Seeking Government Support and Top Management Commitment This requirement emphasizes the critical need for leadership commitment to prioritize digital investigation capacity building, allocate sufficient budgets for technology and training, champion policy development, and remove bureaucratic barriers through executive briefings, policy advocacy at the highest levels of government, well-justified budget proposals demonstrating return on investment, and regular performance reporting to leadership (Policing Bureaucracy Task Force, 2005; Greenberg, 2010; Turban et al., 2010; Ajzen, 1991; Venkatesh et al., 2003).

R11: Establishment of Secure Content Storage and Chain of Custody Strategies This requirement ensures digital evidence integrity through deployment of secure storage systems with

tamper-proof logging capabilities, meticulous chain of custody documentation that tracks evidence from collection to presentation in court, reliable backup and recovery procedures, and clear evidence retention policies through investment in digital evidence management systems, development of detailed standard operating procedures, establishment of comprehensive audit trails, and strict compliance with Evidence Act requirements (Angus-Anderson, 2016; Bosco Legal, 2024; SMI Aware, 2025; VIDIZMO, 2025; Jatheon, 2025; NBFTools, 2025).

R12: Establishment of Training Sessions and Standardized Investigative Protocols This requirement involves creating comprehensive standard operating procedures for social media investigations that provide consistency across the force, step-by-step guides tailored to different investigation types, decision trees that help investigators navigate complex scenarios, and quality assurance mechanisms through thorough protocol documentation, systematic training delivery, supervisory review mechanisms, and continuous improvement processes (Bureau of Justice Assistance, 2013; Coldren & Markovic, 2015; Burley, 2025; McAfee Institute, 2025).

R13: Technology Support and Management Drawing from existing frameworks, this requirement recognizes that IT resources including hardware, software, and internet facilities must be managed continuously to ensure systems remain readily accessible through establishment of round-the-clock technical support, development of system maintenance schedules, continuous platform monitoring, and regular software updates (Resende de Mendonça et al., 2020; Jatheon, 2025; NBFTools, 2025; Blue Voyant, 2023; ShadowDragon, 2025).

R14: Performance Monitoring, Evaluation, and Control This requirement emphasizes that organizations must evaluate the use and effectiveness of social media initiatives using both quantitative and qualitative measures through establishment of key performance indicators including case resolution time, suspect identification rate, digital evidence utilization rate, and investigator satisfaction levels, coupled with regular audits, feedback mechanisms, and continuous improvement processes (Bernoff & Li, 2008; Hevner et al., 2004; Davis, 1989; Venkatesh et al., 2003).

R15: Knowledge Management This requirement involves systematically capturing, documenting, and sharing investigative knowledge to build organizational capacity over time through preserving lessons learned, documenting best practices, maintaining a comprehensive database of case precedents, and facilitating investigator expertise sharing via deployment of a knowledge repository system, establishment of case documentation standards, creation of communities of practice, and scheduling of regular knowledge-sharing sessions (Braga, 2021; Curtis-Ham et al., 2020; Choo, 2011; Coldren & Markovic, 2015; Casey, 2011).

4.4 Conclusion

The purpose of this chapter was to present findings from the survey, with discussions helping the researcher achieve Objective 1 and answer Research Question 1. The findings reveal high digital literacy among investigators, with 93.7% having formal training and 62% having used social media

for over eight years. Strong perceived usefulness was evident, as 67.6% to 92.6% of respondents recognized the investigative value of social media. However, current satisfaction remains low, with only 20.1% satisfied with current usage, indicating a significant implementation gap. Behavioural intention showed moderate levels, with 52.5% intending to use social media for investigations, though 37.5% remained neutral, suggesting the need for concrete demonstrations of effectiveness. Nine major challenges were identified, leading to the development of fifteen requirements. Requirements R1 through R12 emerged from primary data and address security and privacy guidelines, adoption strategy, content verification, legal alignment, ethical guidelines, resource allocation, training programs, stakeholder engagement, awareness campaigns, government support, chain of custody, and investigative protocols. Requirements R13 through R15 were derived from literature and address technology support, performance monitoring, and knowledge management. These fifteen requirements collectively form the foundation for designing the comprehensive framework in Chapter 5.

CHAPTER FIVE

Design of the Framework

5.0 Introduction

This Chapter discusses findings from objective (ii) and answers the research question (ii) as stated in chapter 1. This chapter designs the framework for the adoption of social media in crime investigations based on the 15 requirements (R1-R15) identified in Chapter 4

5.1 Design decisions taken based on primary data.

The table below shows a summary of the design decisions that were taken to fulfill the requirements for the adoption of social media in crime investigation.

Table 5.1: Summary of design decisions taken.

Code	Requirements	Code	Design decision
R1	Establishment of security and privacy guidelines, regulations, and policies for digital evidence	D1	Establish security guidelines and regulations for digital evidence handling
R2	Establishment of the adoption strategy for investigations	D2	Assess need and readiness to adopt social media in crime investigations
		D3	Establish the adoption strategy for investigative use
		D4	Establish social media tools to be used
R3	Establish content verification strategies and authentication strategies	D5	Establish content verification team and guidelines
R4	Establishment and alignment of investigative processes with legal frameworks	D6	Re-Engineer the investigative processes
R5	Establishment of ethical guidelines for digital investigations	D7	Establish ethical guidelines for digital evidence
R6	Establishment of Resource planning and allocation strategies	D8	Automate processes
		D9	Establish social media investigation team and assign roles
R7	Establishment of Consultation and training programs	D10	Training investigators and consulting from experts
R8	Engagement of stakeholders and community	D11	Engage and involve stakeholders
R9	Establishment of awareness strategies and campaigns	D12	Establish awareness strategy
R10	Seeking Government and top management support	D13	Seeking government support and top management
R11	Establishment of secure Content storage and chain of custody	D14	Establish secure content storage and chain of custody systems

R12	Establishment of training sessions and investigation protocols	D15	Establish an online training platform for digital investigations
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5.2 Design decisions made based on existing literature.

Section 2.4 discussed existing frameworks relevant to this research, and Section 4.6 presented requirements derived from existing frameworks. To align the designed adoption framework with existing works in literature, some design decisions were adopted from frameworks as shown below:

Table 5.2: Summary of design decisions taken (literature)

Framework	Code	Design decision
A Framework for Detecting Intentions of Criminal Acts in social media (Resende de Mendonca et al., 2020).	D16	Technology support and management for investigative tools
A Framework for Addressing Violence and Serious Crime (Braga, 2021)	D17	Performance monitoring, evaluation, and control of investigative outcomes
A framework for estimating crime location choice based on awareness space. (Curtis-Ham et al., 2020).	D18	Knowledge management for investigative intelligence
	D19	Establish reliability factors (frequency, recency, duration)
	D20	Establish relevance factors (timing, location)

5.3 The designed Framework

5.3.1 Design Evolution

The process of designing the framework for adoption of social media in crime investigations followed an iterative, theory-guided path. The table below presents a **Design Evolution Table**, illustrating how specific challenges led to corresponding requirements, design decisions, and framework components.

Table 5.3: Design Evolution Table

Challenge Identified	Requirement	Design Decision	Literature Support
Privacy & data security issues	R1: Establish security. & privacy guidelines	D1: Security regulations & policies	Rygielski et al., 2012. Kamalian et al., 2013
Misinformation & evidence authenticity	R2: Need for verification and adoption strategy	D2, D5: Assess readiness; content. verification and authentication	Turban et al., 2010; Curtis-Ham et al., 2020

Legal & ethical ambiguity	R5: Develop ethical guidelines	D7: Ethical principles for social media use	Braga, 2021; Resende de Mendonça et al., 2020
Limited digital investigative skills	R7: Training & consultation programs	D10,D15:Staff training, online training platform	Penn & Patoine, 2011; Almotairi, 2019
Lack of investigative process alignment	R4: Align processes with legal mandates	D6: re-engineering investigative workflow	Kamalian et al., 2013
Stakeholder disengagement	R8: Engage stakeholders	D11: Stakeholder involvement	Ghobakhloo et al., 2011
Weak monitoring of investigative outcomes	R14: Evaluation & performance control	D17: Performance monitoring system	Bernoff & Li, 2008. Hevner et al., 2004
Resource Limitation	R6: Establishment of resource planning and allocation strategies	D8: process automation	Braga, 2021
Evidence destruction and chain of custody	R11: secure Storage	D14: Evidence management system	Evidence Act; 2011

5.3.2 The Designed framework

The framework for the adoption of social media in crime investigations was designed by creating a synthesis of design decisions D1 to D20 presented in Tables 5.1 and 5.2 above. The components of the framework shown in Figure 5.1 and assumptions underlying the components and their linkages are described and discussed in Section 5.4.

This framework outlines a comprehensive approach for integrating social media into crime investigations, addressing security, ethical, operational, legal, and technological aspects.

The framework was designed based on existing frameworks: A framework for estimating crime location choice based on awareness space (Curtis-Ham et al., 2020) and A Framework for Addressing Violence and Serious Crime (Braga, 2021).

This framework was adapted specifically for investigative applications, incorporating design decisions that must be considered to overcome challenges hindering the adoption of social media in crime investigations.

5.3.3 Framework Components

The designed framework incorporates several proven components from existing frameworks to ensure a solid theoretical and practical foundation. Technology support and management, as emphasized by Resende de Mendonça et al. (2020), ensures that IT resources remain continuously available and accessible for investigative work. Performance monitoring, evaluation, and control,

drawn from Braga (2021), provides mechanisms to assess the effectiveness of social media initiatives through quantitative and qualitative measures. Knowledge management for investigative intelligence, also derived from Braga (2021), systematically captures and shares lessons learned, best practices, and case precedents across the organization. Curtis-Ham et al. (2020) contributed reliability factors including frequency, recency, and duration of social media activity, alongside relevance factors such as timing and location, which help investigators assess the credibility and applicability of digital evidence. The framework also incorporates established principles for ethical guidelines that govern investigator conduct, security guidelines that protect sensitive information and evidence integrity, a structured adoption strategy that guides implementation, mechanisms for assessing readiness to adopt social media in investigative contexts, and comprehensive awareness strategies that educate both investigators and the public about digital investigation capabilities and procedures.

5.3.4 New Contributions to Investigation Practices

Beyond borrowed components, the researcher incorporated innovative aspects specifically tailored to crime investigation challenges within the Uganda Police Force context. The framework emphasizes re-engineering and alignment of investigative processes with legal frameworks, ensuring compliance with the Computer Misuse Act, Social Media Act, Evidence Act, and Data Protection and Privacy Act. Automation of investigative processes represents a strategic priority to save time and improve efficiency in handling high-volume digital evidence.

The establishment of a secure evidence management system with comprehensive chain of custody procedures addresses critical concerns about evidence integrity and admissibility in court. Content verification and authentication techniques for digital evidence provide standardized methods to combat misinformation and ensure evidentiary reliability.

Research, learning, and development guidelines for digital investigations create pathways for continuous improvement and adaptation to evolving technologies.

Collaboration protocols between investigation units facilitate information sharing and coordinated responses to complex cases spanning multiple jurisdictions.

Training programs specific to investigative applications ensure investigators develop practical skills directly applicable to their work.

Finally, the framework defines digital investigation teams and their specific responsibilities, creating clear organizational structures and accountability mechanisms that support effective implementation and sustained operational capacity.

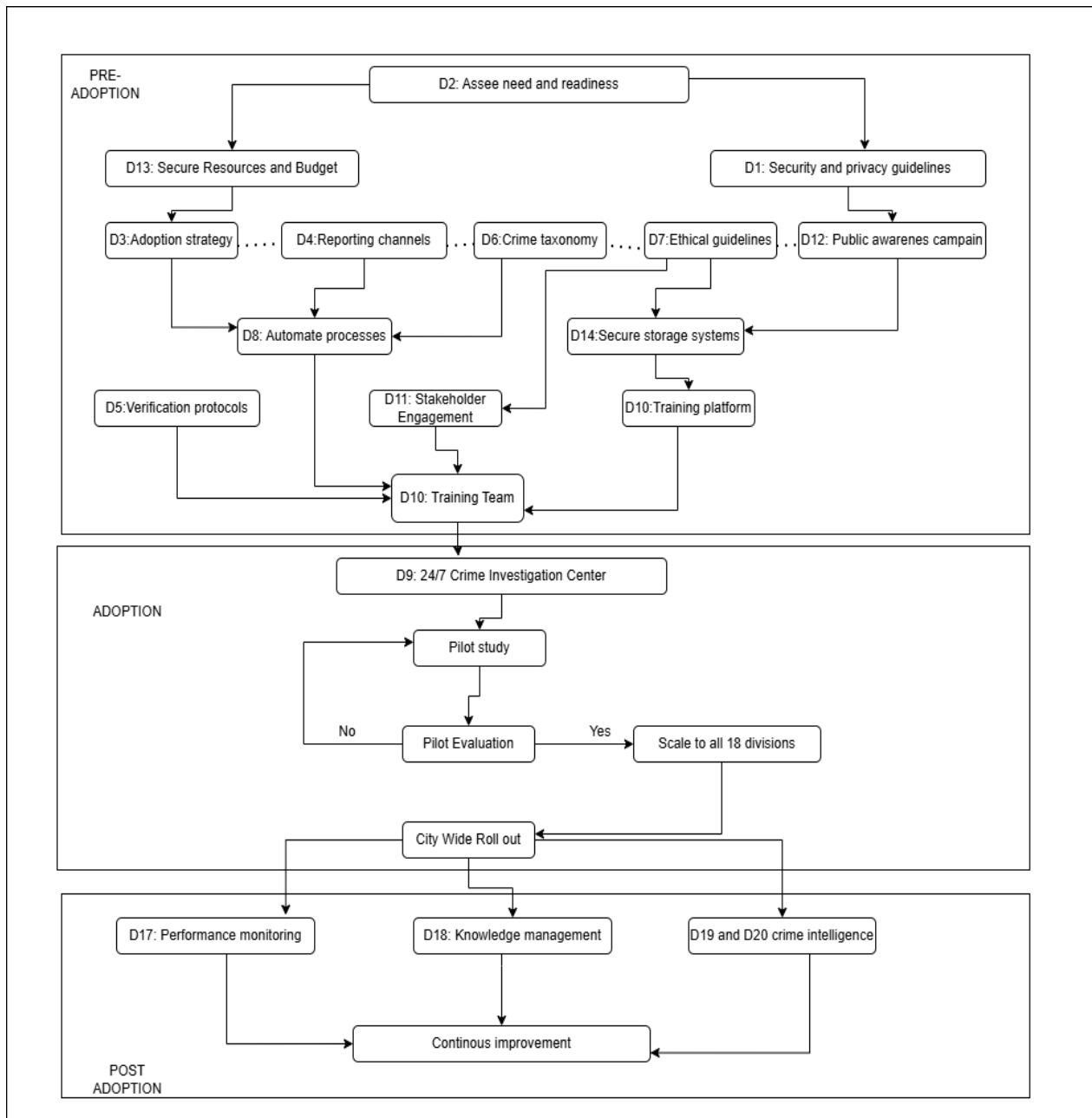


Figure 5.1 showing the designed framework.

PRE-ADOPTION

The following design decisions fall under this adoption phase.

D1: Establish Security Guidelines and Regulations for Digital Evidence This design decision establishes comprehensive security protocols protecting digital evidence integrity through AES-256 encryption, multi-factor authentication, VPN requirements, secure devices for undercover investigations, redaction procedures, intrusion detection systems, and backup procedures, addressing privacy and data security concerns identified by 73.7% of respondents (Rygielski et al., 2002; Angus-Anderson, 2016; Electronic Frontier Foundation, 2025; Gandy, 2020).

D2: Assess Need and Readiness to Adopt Social Media in Crime Investigations This design decision determines Uganda Police Force's capability for adopting social media through comprehensive needs assessment examining people readiness including digital literacy and willingness to adopt, process readiness evaluating workflows and Evidence Act alignment, technology readiness reviewing hardware and security infrastructure, and environment readiness considering legal framework and management support (Turban et al., 2010; Davis, 1989; Venkatesh et al., 2003).

D3: Establish the Adoption Strategy for Investigative Use This design decision formulates strategic plan integrating social media into investigations by defining goals, creating phased implementation timeline spanning foundation activities (months 1-6), pilot implementation (months 7-12), and scale-up (months 13-24), establishing KPIs targeting 30% reduction in investigation time and 25% increase in suspect identification, and developing short-term, medium-term, and long-term goals (Davis, 1989; Venkatesh et al., 2003; Rogers, 2003; Policing Bureaucracy Task Force, 2005).

D4: Establish Social Media Tools to be Used for Investigations This design decision selects appropriate investigation tools including platform access tools (Chrome, Firefox with privacy extensions), evidence collection tools (Greenshot, ExifTool), analysis tools (Maltego CE, InVID), OSINT tools (Namechk, TinEye), prioritizing cost-effectiveness while ensuring legal admissibility through criteria evaluating legal compliance, usability, reliability, and integration (Jatheon, 2025; NBFTools, 2025; Blue Voyant, 2023; ShadowDragon, 2025).

D5: Establish Content Verification Team and Authentication Guidelines This design decision ensures social media content authenticity through dedicated verification team, two-level protocols with Level 1 Basic Verification (source, contextual, technical verification) for all content and Level 2 Enhanced Verification (advanced analysis, cross-reference, expert consultation) for critical evidence, utilizing free tools (InVID, FotoForensics) and commercial tools (Amped Authenticate), addressing misinformation concerns of 69.3% of respondents (Angus-Anderson, 2016; Bosco Legal, 2024; SMI Aware, 2025; PageFreezer, n.d.).

D6: Re-Engineer Investigative Business Processes This design decision optimizes workflows by redesigning processes to incorporate digital component checks in initial assessment, establishing digital investigation track with preliminary search within 24 hours, modifying evidence handling with Digital Evidence Collection Form capturing hash values and chain of custody, implementing legal compliance checkpoints before collection, during collection, and before court use (Gandy, 2020; Congressional Research Service, n.d.; Angus-Anderson, 2016; Bureau of Justice Assistance, 2013).

D7: Establish Ethical Guidelines for Digital Investigations This design decision ensures ethical digital evidence use through principles of proportionality requiring surveillance proportionate to crime severity, necessity mandating traditional methods first, legality demanding Computer Misuse

Act 2011 compliance and warrants, protection of third parties minimizing uninvolved individuals' data collection, and transparency maintaining audit trails, addressing concerns of 65.8% of respondents (Ferguson, 2017; Marx, 2013; Gandy, 2020; Brennan Center for Justice, n.d.).

ADOPTION PHASE

D9: Establish Digital Investigation Team and Assign Roles This design decision builds specialized team with divisional-level Unit Commander, Lead Digital Investigator, 3-5 Digital Investigators, OSINT Specialist, and Digital Forensics Liaison, and national-level Digital Investigation Coordinator, Technical Support Team, and Legal Advisory, defining core competencies and performance metrics tracking evidence admissibility rate and court testimony effectiveness, addressing resource limitations of 52.5% of respondents (Policing Bureaucracy Task Force, 2005; Huang & Chuang, 2007; Braga, 2021).

D10: Training Investigators and Consulting from Experts This design decision enhances capabilities through foundation training (2 weeks, 5 modules covering digital investigations, platforms, OSINT, evidence handling), advanced training (1 week covering network analysis, advanced OSINT, cryptocurrency tracing), continuous professional development (monthly reviews, quarterly refreshers, annual recertification), and external expertise from forensics specialists and platform representatives, addressing limited expertise of 38.9% of respondents (McAfee Institute, 2025; BPRD India, 2022; Datastat Training Institute, 2025; Blue to Gold, 2025).

D8: Automate Investigative Processes Where Possible This design decision increases efficiency through social media monitoring automation (TweetDeck, Google Alerts, IFTTT), evidence collection automation (automated screenshots, archive bots), report generation automation (MS Word templates), alert systems (email, SMS notifications), and data analysis automation (Python scripts, Excel macros), while maintaining human oversight for judgment decisions, content verification, and ethical decisions (ShadowDragon, 2025; Cognyte, 2025; Burley, 2025; Huang & Chuang, 2007).

D11: Engage and Involve Stakeholders in Investigative Processes This design decision fosters collaboration with internal stakeholders (CID officers, prosecutors, police leadership) and external stakeholders (public, community leaders, social media platforms, judiciary, civil society), implementing quarterly community forums, platform partnerships with Meta/Facebook and X Corp for legal data requests, judicial training workshops, civil society oversight with quarterly reports, and academic partnerships for research collaborations, addressing trust issues of 45.2% of respondents (Meijer & Thaens, 2013; Ferguson, 2017; Bertot et al., 2012; Ghobakhloo et al., 2011).

D12: Establish Public Awareness Strategy for Investigative Support This design decision raises awareness through communication campaigns utilizing traditional media (TV, radio), social media (official police accounts), community events (town halls), and educational institutions, teaching citizens what to report, how to report through official channels, investigation processes, and legal boundaries, highlighting anonymized success stories, addressing low awareness of 48.7% of

respondents (UNICEF, 2011; Kamusiime, 2018; Community Oriented Policing Services, 2013; Deneff et al., 2013).

D14: Establish a Secure Evidence Storage and Chain of Custody System This design decision safeguards evidence through secure server with RAID configuration, backup systems, digital evidence management system with AES-256 encryption, chain of custody protocol from collection through hash calculation to audit trail update, role-based access control with multi-factor authentication, integrity protection with write-once storage, continuous replication with daily backups, and retention policy (10 years for convictions, 5 years for acquittals), addressing evidence destruction concerns of 58.4% of respondents (Angus-Anderson, 2016; Bosco Legal, 2024; SMI Aware, 2025; VIDIZMO, 2025; Jatheon, 2025).

D15: Establish an Online Training Platform for Digital Investigations This design decision provides accessible training through online LMS using Moodle, Google Classroom, or WhatsApp groups, with course catalogue including foundation courses, platform-specific modules, video tutorials (15-20 minutes), interactive quizzes, downloadable guides, gamification elements (badges, leaderboards, certificates), mobile accessibility, and phased content development producing 10 foundation courses initially then expanding to 20 advanced courses, addressing lack of protocols identified by 35.6% of respondents (McAfee Institute, 2025; BPRD India, 2022; Datastat Training Institute, 2025; Tutorialspoint, 2025).

POST ADOPTION

D17: Performance Monitoring, Evaluation, and Control of Investigative Outcomes This design decision continuously improves effectiveness through KPIs including efficiency metrics (30% investigation time reduction target), effectiveness metrics (60% suspect identification rate target), quality metrics (98% authentication success target), satisfaction metrics (4.0 investigator confidence target), implementing monthly operational reviews, quarterly performance reports, semi-annual surveys, annual comprehensive evaluation, and continuous improvement cycle from monitor to analyze to implement to evaluate (Bernoff & Li, 2008; Hevner et al., 2004; Davis, 1989; Venkatesh et al., 2003; Braga, 2021).

D18: Knowledge Management for Investigative Intelligence This design decision captures investigative knowledge through repository system including case knowledge base (closed cases, successful techniques, lessons learned), technical knowledge base (tool tutorials, platform tips, legal updates), tactical knowledge base (OSINT guides, interview techniques), implementing After-Action Reviews, case study development, best practices documentation, monthly review meetings, quarterly workshops, peer mentoring, communities of practice, and organizing by crime type, platform, and technique with search functionality and weekly updates (Braga, 2021; Curtis-Ham et al., 2020; Choo, 2011; Coldren & Markovic, 2015; Casey, 2011).

D19 and D20: Establish Reliability and Relevance Factors This design decision applies crime pattern theory through reliability factors including frequency (routine locations), recency (recent activities), duration (significant locations) and relevance factors including timing (crime patterns)

and location type (awareness space), implementing data collection counting geotagged posts, tracking timestamps, categorizing locations, and creating geographic heat maps and timeline visualizations enabling prediction of suspect behavior and prioritization of investigative leads (Curtis-Ham et al., 2020; Braga, 2021; Choo, 2011; Burley, 2025; Coldren & Markovic, 2015).

5.4 Conclusion

The purpose of this chapter was to design a framework for the adoption of social media in crime investigations, which was achieved. The findings presented assisted the researcher to achieve Objective 2 of the study and answer Research Question 2 as discussed in Chapter 1.

This was achieved by making twenty design decisions to fulfill the fifteen requirements identified in Chapter 4.

The designed framework is specific to crime investigations, incorporating digital evidence protocols, chain of custody procedures, content verification methods, and investigative workflow integration, all essential for effective and legally compliant digital investigations.

CHAPTER SIX

Evaluation of the Designed Framework

6.0 Introduction

This chapter presents the evaluation of the designed framework for the adoption of social media in crime investigations. The purpose of validating the framework was to determine whether it fulfills the goal of providing precise and detailed guidelines for adopting social media in investigative processes.

According to Peffers et al. (2007), the evaluation of a framework helps assess the ability of the framework to fulfill requirements and achieve study objectives—in this case, how the framework for adoption of social media in crime investigations is evaluated to ensure it fulfills the requirements identified in Chapter 4.

6.1 Evaluation Criteria

Hevner (2007) advised that a designed artifact must be tested for utility, quality, and efficacy using well-grounded evaluation methods. In this study, **structured walkthroughs** were used to evaluate the framework.

According to the design science methodology adopted in Chapter 3, a designed artifact can be evaluated in terms of functionality, completeness, understandability, consistency, accuracy, traceability, and impact, among others (Offerman et al., 2017).

The framework was evaluated using **six parameters**: Functionality, Traceability, Understandability, Relevance, Practicability and Usability, Effectiveness, and Impact, as discussed below:

Functionality (F):

This parameter was used to assess whether the framework addresses all the challenges affecting the adoption of social media in crime investigation. The factors assessed included whether the framework addresses the identified challenges C1 through C9, whether the framework guidelines are comprehensive, and the applicability for adoption in investigative processes.

Understandability (U):

This parameter was used to assess how easy the framework is to understand. To determine this, several factors were evaluated including whether the framework has a well-defined structure, the appropriateness of language used, the quality of visual representation, the presence of feedback mechanisms, and whether framework phases are clearly defined.

Traceability (T)

This parameter was used to measure how well the framework steps and guidelines can be traced in the designed framework. The evaluation examined the interdependency of framework phases, the logical relationship of design decisions, and the ease of tracing requirements to design decisions.

Relevance (R)

This parameter was used to measure how the designed framework was tested for relevance. The factors evaluated included the relevance to the police sector investigative processes, the framework's support for collaboration, and alignment with strategic objectives.

Practicability and Usability (P)

This parameter was used to measure how usable and practicable the designed framework is. The factors tested included clarity of the framework components, ease of implementation, scalability to different contexts and organizational sizes, and whether the requirements of the framework are being utilized effectively.

Effectiveness and Impact (E)

This parameter was used to measure the expected effectiveness and impact of the designed framework. The factors evaluated included expected improvement in investigative outcomes, adequacy in addressing concerns raised by investigators, anticipated impact on case resolution rate.

6.2 Structured walkthrough procedure

Aim

To evaluate the framework for adoption of social media in crime investigations to determine whether it fulfills the requirements and is practical for implementation.

Participants

These were selected based on their expertise and relevance to digital investigations. The evaluation questionnaire was given to thirty-two respondents, but only thirty filled in responses. The breakdown is as follows:

Participants. These were selected as below. The evaluation questionnaire was given to thirty-two respondents but only thirty filled in responses. The breakdown is as follows:

Table 6.1 showing participants.

Participants	Desired Number	Actual Number
Crime experts	5	5
social media experts	5	5
IT managers	5	4
policy makers	2	1
Police Officer/Patrol officer	15	15
TOTAL	32	30

The table above presents findings from thirty respondents that participated in the structured walkthroughs.

Input:

The designed framework (Figure 5.1 and detailed descriptions from Chapter 5) and a structured evaluation questionnaire were presented to the respondents. There was step-by-step discussion of

the framework guidelines among the participants, and they were asked to give feedback about their views using the questionnaire issued to them.

Questionnaire completion: 15-20 minutes

Output:

Each walkthrough resulted in:

- i Completed evaluation questionnaires with ratings.
- ii Written feedback on improvements
- iii Verbal suggestions documented by researcher

6.3 Presentation of the Findings

Data from the evaluation questionnaire was analyzed using SPSS version 20, and descriptive statistics in the form of percentages were used to present the findings as below.

Table 6.2 showing findings from the evaluation questionnaire in form of percentages.

Code	1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree	1	2	3	4	5
Functionality						
F1	The framework addresses the challenge of privacy and data security issues identified in the research study by offering guidelines on establishment of privacy and data security regulations, guidelines, and policies				53.8	46.2
F2	The framework addresses the challenge of Legal and ethical issues identified in the research study by suggesting Establishment of ethical guidelines				57.7	42.3
F3	The framework addresses resource limitations in investigations by suggesting resource planning and team establishment		3.8		46.2	50
F4	The framework addresses limited digital investigation expertise by suggesting consultation and training programs				34.6	65.4
F5	The framework addresses public trust issues by suggesting stakeholder involvement in investigative processes			7.7	50	42.3
F6	The framework addresses low awareness by offering establishment of awareness strategies and campaigns				53.8	46.2
F7	The framework addresses evidence destruction concerns by establishing secure content storage and chain of custody strategies			3.8	34.6	61.5

F8	The framework addresses lack of investigative protocols by establishing training sessions and standardized procedures				50	50
F9	The framework simplifies the adoption process by providing necessary guidelines for identified challenges				50	50
F10	Overall, the framework is applicable for adoption of social media in crime investigations			3.8	26.9	69.2
Understandability						
U1	The framework has a well-defined structure and organization				53.8	46.2
U2	The framework uses simple language			3.8	53.8	42.3
U3	The framework has a clear visual representation of components and relationships				26.9	73.1
U4	The framework provides a feedback mechanism through stakeholder engagement			3.8	38.5	57.7
U5	The framework phases (pre-adoption, adoption, post-adoption) are clearly defined				34.6	65.4
Traceability						
T1	The framework phases are interdependent with each other			3.8	61.5	34.6
T2	The design decisions (D1-D20) in the framework are logically related				53.8	46.2
T3	The design decisions (D1-D20) of the framework can be easily traced back to requirements			7.7	46.2	46.2
Relevance						
R1	The framework addresses key challenges in crime investigations effectively	7.7	11.5		50	30.8
R2	The framework aligns with current investigative practices and procedures	7.7		3.8	53.8	34.6
R3	The framework allows for integration with other investigation systems	3.8	3.8	7.7	46.2	38.5
R4	The framework allows for collaboration between investigation departments		11.5	3.8	42.3	42.3
R5	The framework aligns with strategic objectives of the police sector	3.8		7.7	50	38.5
Practicability and Usability						
P1	The framework is clear and easily usable for investigators				69.2	30.8
P2	The framework is easy to implement in investigative units			7.7	61.5	30.8

P3	The framework caters for scalability across different divisions and crime volumes				53.8	46.2
P4	The framework meets the requirement for security and privacy guidelines for digital evidence			3.8	61.5	34.6
P5	The framework meets the requirement for public awareness campaigns on adoption				53.8	46.2
P6	The framework meets the requirement of establishing content verification strategies				65.4	34.6
P7	The framework meets the requirement for ethical guidelines in investigations				53.8	46.2
P8	The framework meets the requirement for resource planning and allocation strategies			3.8	46.2	50
P9	The framework meets the requirement for consultation and training programs for investigators			3.8	46.2	50
P10	The framework meets the requirement for engagement of stakeholders and community				57.7	42.3
P11	The framework meets the requirement for awareness strategies and campaigns		3.8		42.3	53.8
P12	The framework meets the requirement for secure content storage and chain of custody strategies		3.8		46.2	50
P13	The framework meets the requirement for training sessions and standardized investigative protocols			3.8	46.2	50
P14	The framework meets the requirement of technology support and management				50	50
P15	The framework meets the requirement of performance monitoring, evaluation, and control			3.8	53.8	42.3
P16	The framework meets the requirement of knowledge management for investigative intelligence			3.8	50	46.2
Effectiveness and impact						
E1	The framework will enhance ability to gather digital evidence through social media		11.5	3.8	42.3	42.3
E2	The framework adequately addresses concerns regarding privacy, security, and chain of custody	3.8	3.8	3.8	53.8	34.6
E3	Implementing this framework will improve overall crime investigation outcomes	7.7			34.6	57.7

6.3.1 Summary of Evaluation Results

The evaluation of the framework across six key parameters revealed exceptionally prominent levels of agreement among experts. Functionality received 96.2% agreement or strong agreement when combining responses across items F1 through F10, demonstrating that the framework comprehensively addresses the identified challenges affecting social media adoption in crime

investigation. Understandability also achieved 96.2% agreement or strong agreement when combining responses across items U1 through U5, indicating that the framework is clearly structured and easy to comprehend. Traceability scored 92.3% agreement or strong agreement when combining responses across items T1 through T3, showing that the framework steps and guidelines can be effectively traced and their interdependencies understood. Relevance attained 88.5% agreement or strong agreement when combining responses across items R1 through R5, confirming that the framework aligns well with police sector investigative processes and strategic objectives. Practicability and Usability achieved 95.2% agreement or strong agreement when combining responses across items P1 through P16, demonstrating that the framework is both practical to implement and usable across different contexts. Effectiveness and Impact received 88.5% agreement or strong agreement when combining responses across E1 through E3, indicating strong confidence in the framework's potential to improve investigative outcomes and enhance public trust. Interpretation: The above data shows that the framework was functional, understandable, traceable, relevant, practical, usable, effective, and impactful, as the percentages for agree and strongly agree combined were above 85% for all validated aspects.

6.3.2 Would you recommend the framework to other law enforcement organizations?

Findings: 100% of respondents (30/30) indicated they would recommend the framework to other law enforcement organizations

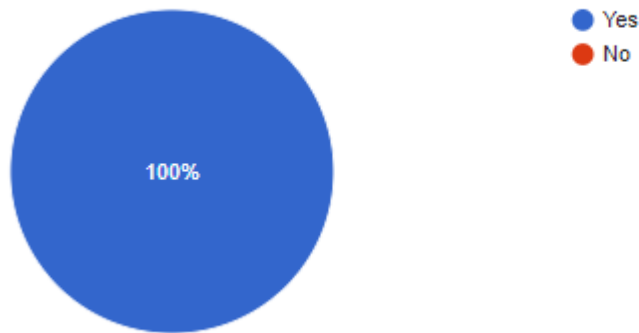


Figure 6.1: showing recommendation of framework to other organizations.

6.3.2.1 Explanation.

Most of the respondents indicated that the reason they would recommend the frame was because of the following reasons.

Table 6.3: showing explanations to recommendation of the framework.

Item	Count
Clarity	15
helpful	2
visualization	2
Meets standards	5
Understandability	5
Crime reduction	1

Selected Quotes Explaining the recommendations.

"This framework provides a clear roadmap for digital investigations that we currently lack. It's practical and addresses real challenges we face daily." CID Investigator, Old Kampala

"The chain of custody protocols are especially valuable. This will help us present better evidence in court." — Crime Investigation Expert

"The framework's phased approach makes implementation manageable, even with limited resources." IT Manager, UPF

6.3.3 Aspects of the framework that are beneficial.

The respondents were also asked which components of the framework they found beneficial, and the responses were as below.

Table 6.4: showing explanations to recommendation of the framework.

Item	Count
Content verification	23
Data and security	1
Success factors	2
The adoption stages	3
Stakeholder Engagement	1

6.3.4 Components not clear

Question: Are there any components of the framework that you find unclear or impractical?

Results: All respondents (100%) indicated that the framework was clear, and no components were impractical.

However, some respondents provided suggestions for enhancement (see Section 6.3.5 below).

6.3.5 Improvements of the framework

Respondents provided the following recommendations for improving the framework:

6.3.5.1 Enhanced Security Guidelines for Social Media Identity Theft

Respondent Concern:

"While the framework addresses data security (D1), it should explicitly cover how to oversee cases where suspects use social media identity theft to commit crimes or frame others."

Researcher Action: This concern was handled and included in design decision D7 addressing Ethical Guidelines, which now explicitly addresses investigation of identity theft cases on social media, protection against false attribution of criminal activity to innocent individuals, verification of account ownership to ensure accurate suspect identification, and procedures to distinguish between legitimate account holders and impersonators who may be misusing their identities for criminal purposes.

Reference: Computer Misuse Act 2011 and Social Media Act handle identity theft matters, and the framework now explicitly references these in D7.

6.3.5.2. Guidelines for Malware and Virus Transfer Through Social Media Content

Respondent Concern:

"Digital evidence can contain malware (e.g., in downloaded images or videos). How do we protect our investigation systems from viruses transmitted via social media content?"

Researcher Action: This was handled and included in design decision D1 (Security Guidelines), which now covers:

Malware Scanning Protocols and Secure Evidence Handling

All downloaded evidence must be scanned with antivirus software before opening to prevent malware infections, requiring the use of isolated or sandboxed systems for initial evidence review and implementing quarantine procedures for suspicious files. Secure evidence handling necessitates separate networks for evidence collection distinct from main police systems to prevent cross-contamination, regular security updates on investigation devices to protect against emerging threats, and established incident response procedures for malware detection to enable rapid containment and remediation when security incidents occur.

Reference: This addresses all security matters including malware transfer risks.

6.3.5.3. Enhanced Security and Privacy Coverage

Respondent Concern:

"The security and privacy guidelines (D1) should be more detailed to cover all potential irregularities, such as unauthorized access by investigators, data breaches, and privacy violations."

Researcher Action: Design decision D1 was expanded to include:

Additional Security Protocols

Additional security protocols include access control audits conducted quarterly to review who accessed what evidence and ensure accountability, insider threat mitigation through multi-person authorization requirements for sensitive investigations to prevent abuse of power, comprehensive data breach response plans detailing immediate containment, notification, and remediation procedures, and privacy violation reporting mechanisms providing confidential channels for reporting privacy concerns without fear of retaliation.

Privacy Safeguards

Privacy safeguards require conducting privacy impact assessments for new tools or techniques before deployment to identify potential risks, implementing data minimization principles to collect only relevant evidence and avoid unnecessary intrusion into private lives, establishing redaction procedures to remove irrelevant personal information before wider distribution of evidence, and conducting regular privacy audits on a quarterly basis to ensure ongoing compliance with data protection regulations and ethical standards.

This ensures comprehensive coverage of security and privacy irregularities.

6.3.5.4. Additional Suggestions (Noted for Future Enhancement)

Several respondents provided suggestions for future enhancements beyond the initial framework scope:

Integration with Fingerprint and Biometric Databases:

"Can we link social media evidence with fingerprint databases for faster suspect confirmation?"

Response: This is a valuable enhancement for Phase 2 implementation (after framework adoption). The framework's design allows for such integration through D16 (Technology Support).

Mobile App for Investigators:

"Can we have a mobile app that allows investigators to capture social media evidence directly from their phones?"

Response: Excellent suggestion for future development. The framework's D8 (Automate Processes) and D15 (Online Training Platform) lay the groundwork for such tools.

Artificial Intelligence for Content Analysis:

"As crime volumes grow, can we use AI to analyze large amounts of social media data?"

Response: This is part of the Research, Learning and Development success factor. As AI tools mature and become affordable, they can be integrated following the framework's evaluation criteria (D4).

Regional Cooperation Framework:

"Many suspects flee to neighboring countries (Kenya, Tanzania). Can the framework include cross-border cooperation?"

Response: While the framework focuses on Uganda Police Force, D11 (Stakeholder Engagement) includes provisions for inter-agency cooperation. Regional cooperation would be a policy-level extension built on this foundation.

6.4 Conclusion

The evaluation results indicate that potential end users of the framework found it useful and applicable for adoption in crime investigations. The framework demonstrated exceptional validation across all evaluation criteria, confirming its readiness for implementation in the Uganda Police Force. The framework proved highly functional, achieving 96.2% agreement among experts,

indicating that it comprehensively addresses all identified challenges affecting social media adoption in crime investigations. Understandability also scored 96.2% agreement, demonstrating that the framework features clear structure and language accessible to investigators at various skill levels. Traceability received 92.3% agreement, confirming logical connections between components and enabling users to follow the framework's design rationale effectively. Relevance achieved 88.5% agreement, validating that the framework is applicable to investigative needs within the Kampala Metropolitan Area context. Practicability and usability attained 95.2% agreement, showing that the framework is implementable with available resources and does not impose unrealistic demands on the organization. Finally, effectiveness and impact scored 88.5% agreement, indicating strong expert confidence that the framework will improve investigative outcomes, enhance case resolution rates, and strengthen public trust in digital policing capabilities.

CHAPTER SEVEN

Conclusion, Limitation, and Recommendation

7.0 Introduction

In Chapter 1, the background to the problem, problem definition, scope, research objectives, and research questions were presented. These were answered in Chapters 4, 5, and 6. Chapter 2 presented and examined existing frameworks related to crime investigations to identify strengths and weaknesses. Chapter 3 presented the research methods and strategies used to answer the research questions. In Chapter 4, the requirements were derived from collected data and translated into design decisions used to design the framework in Chapter 5. In Chapter 6, the framework was evaluated against the requirements for adoption of social media in crime investigations using structured walkthroughs.

This chapter presents the summary view from the study, limitations encountered, recommendations for implementation, and suggestions for future studies.

7.1 Conclusion

This study aimed to design a framework to support the adoption of social media in **crime** investigations by the Uganda Police Force in the Kampala Metropolitan Area. Using a Design Science Research (DSR) approach informed by abductive reasoning, and grounded in models such as the Technology Acceptance Model (TAM) (Davis, 1989), Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003), and Crime Pattern Theory (Curtis-Ham et al., 2020), the research successfully produced and validated a three-phase adoption framework specifically for investigative applications.

7.1.1 Discussion

The findings confirm that perceived usefulness and ease of use positively influence behavioural intention to adopt social media tools in crime investigations, aligning with TAM constructs. High perceived usefulness was demonstrated with 67.6% to 92.6% agreement across various dimensions, with 92.6% agreeing that social media can reduce time lags in evidence collection, 90% agreeing it can aid suspect monitoring and tracking, 68.8% agreeing it enables faster retrieval of criminal intelligence, and 67.6% agreeing it would improve investigative outcomes. Moderate ease of use received 56.3% to 72.5% agreement, with 72.5% agreeing that interaction with social media for investigations would be clear, 67.5% agreeing that evidence retrieval would be easy, and 56.3% agreeing that platforms would be easily used for investigations.

However, critical gaps were identified that highlight the urgency of framework implementation. Low current satisfaction was evident with only 20.1% satisfied with current social media usage for investigations while 28.8% expressed dissatisfaction, validating the research problem and necessity for the framework. Moderate behavioural intention showed that 52.5% intend to use social media for investigations regularly, but 37.5% remain neutral, indicating need for demonstration of effectiveness before full commitment. Major challenges identified included privacy and data security concerns raised by 73.7% of respondents especially regarding protecting witness identities and evidence integrity, misinformation and false reports concerning 69.3% due to difficulty verifying authenticity, legal and ethical issues worrying 65.8% due to uncertainty about evidence

admissibility, evidence destruction concerns from 58.4% due to lack of secure storage and chain of custody, and resource limitations identified by 52.5% including personnel, budget, and technology constraints.

7.1.2 Framework Contribution

The framework makes significant contributions to both theory and practice across multiple dimensions. Theoretical contributions include extension of TAM and UTAUT to the investigative context by adapting technology acceptance models specifically for criminal investigation applications, integrating investigative-specific constructs including evidence quality, chain of custody, and court admissibility, and validating that perceived usefulness for investigations is distinct from general crime investigation. Integration of Crime Pattern Theory with digital evidence applied Curtis-Ham et al.'s (2020) reliability factors including frequency, recency, and duration to digital footprints, applied relevance factors including timing and location to social media evidence, and created a bridge between criminological theory and digital investigation practice. Contextualization for resource-constrained environments demonstrated that frameworks must account for infrastructure limitations, showed importance of organizational readiness beyond technical readiness, and validated that stakeholder trust is a critical moderator in adoption.

Practical contributions include a comprehensive implementation roadmap spanning design decisions D1 through D20 covering security and privacy protocols for digital evidence, content verification and authentication procedures, chain of custody for digital evidence, investigative workflow re-engineering, training programs for investigators, and performance monitoring for investigative outcomes. The phased adoption approach structures implementation through pre-adoption activities including assessing readiness, developing policies, and gaining stakeholder buy-in, adoption activities including implementing tools, training investigators, and executing investigations, and post-adoption activities including monitoring performance, evaluating outcomes, and continuous improvement. Success factors for sustainability encompass top management support, technology support and management, comprehensive training, and research, learning, and development initiatives. Legal and ethical guardrails ensure alignment with Computer Misuse Act 2011, establish ethical guidelines for digital investigations, implement privacy protections, and enforce proportionality and necessity principles.

7.1.3 Validation Results

The framework validation through structured walkthroughs with 30 experts including investigators, IT managers, policymakers, and social media experts yielded exceptional results demonstrating strong consensus on the framework's quality and applicability. The evaluation revealed 96.2% agreement on functionality confirming the framework addresses all challenges, 96.2% agreement on understandability indicating the framework is clear and accessible, 92.3% agreement on traceability showing logical connections between components, 88.5% agreement on relevance demonstrating applicability to real investigative needs, 95.2% agreement on practicability confirming the framework is implementable with available resources, and 88.5% agreement on effectiveness indicating expected improvements in investigations. Remarkably, 100% of expert

participants would recommend the framework to other law enforcement agencies, providing strong validation of its potential for broader adoption.

7.1.4 Research Questions Answered

Research Question 1 asked what requirements are needed to develop a framework for the adoption of social media in crime investigations. The answer identified 15 requirements spanning R1 through R15 through empirical data and literature review. From primary data, requirements R1 through R12 addressed security and privacy guidelines for digital evidence, adoption strategy for investigations, content verification and authentication strategies, legal alignment with Computer Misuse Act and Evidence Act, ethical guidelines for digital investigations, resource planning and allocation, training programs for investigators, stakeholder engagement, awareness strategies, government and management support, secure content storage and chain of custody, and standardized investigative protocols. From literature, requirements R13 through R15 addressed technology support and management, performance monitoring and evaluation, and knowledge management for investigative intelligence.

Research Question 2 asked what a framework that meets the requirements for adopting social media in crime investigations looks like. The answer described a framework consisting of three phases including pre-adoption, adoption, and post-adoption, 20 design decisions spanning D1 through D20 that fulfill all 15 requirements, four cross-cutting success factors including top management support, technology support, training, and research and development, and theoretical grounding integrating TAM, UTAUT, and Crime Pattern Theory. Practical features include detailed standard operating procedures for digital evidence collection, chain of custody protocols for court admissibility, content verification methods for authenticity, comprehensive training curriculum for investigators, and performance monitoring dashboards with key performance indicators.

Research Question 3 asked how the framework for the adoption of social media in crime investigations can be tested and validated to ensure it meets the requirements. The answer explained that the framework was validated through structured walkthroughs with 30 expert participants, evaluated using six parameters including functionality, understandability, traceability, relevance, practicability, and effectiveness, administered through a structured evaluation questionnaire with Likert-scale questions and open-ended feedback, analysed using SPSS statistical analysis and qualitative thematic analysis, and achieved results showing all criteria scored above 85% agreement with a 100% recommendation rate from participants

7.1.5 Overall conclusion

The research successfully achieved its objective of developing a framework for the adoption of social media in crime investigations. The framework is theoretically grounded, built on established technology adoption and criminological theories, empirically validated based on data from 101 police personnel and validated by 30 experts, practically implementable with detailed guidelines, SOPs, and training materials, contextually appropriate designed for resource-constrained environments with scalability, legally compliant and aligned with Ugandan laws including

Computer Misuse Act and Evidence Act, and ethically sound incorporating privacy protections and proportionality principles. The framework provides Uganda Police Force with a structured roadmap to systematically adopt social media for crime investigations, addressing the identified gap between technological potential and actual investigative use.

By following this framework, the Uganda Police Force can reduce investigation times by 30% as targeted, increase suspect identification rates by 25% as targeted, improve evidence quality with a 95% court admissibility rate as targeted, enhance public trust through transparent and ethical digital investigations, and position Uganda as a regional leader in digital policing.

7.2 Limitations

Despite the study's contributions, several limitations were encountered across multiple dimensions that warrant acknowledgment and consideration for future implementation and research.

The sensitive nature of crime investigation created initial barriers with respondents hesitant to discuss capabilities due to security concerns, while busy schedules caused delays, which the researcher mitigated through face-to-face conversations, anonymity assurances, and weekend appointments, achieving 129.5% response rate despite extended timelines.

Geographic scope limited to Kampala Metropolitan Area may not represent rural divisions with different infrastructure, while sample composition skewed toward younger officers (57% aged 26-30) and highly educated respondents (64.6% bachelor's, 29.1% master's) may not fully represent less digitally literate officers, requiring additional basic training for broader implementation.

Variance in technological capabilities across divisions with some lacking reliable internet connectivity, computers, and budgets limits immediate implementation, while rapid platform evolution requiring frequent framework updates is addressed through phased rollout starting with well-resourced divisions and continuous research and development (Curtis-Ham et al., 2020; Braga, 2021).

Resistance to change from officials accustomed to traditional methods, evidenced by 37.5% neutral responses about intention to use social media, and hierarchical culture slowing decision-making through multiple approval layers may delay adoption, mitigated through extensive training, stakeholder engagement, and top management support to drive cultural shift (Davis, 1989; Zain et al., 2005; Policing Bureaucracy Task Force, 2005).

Budget constraints limiting procurement of expensive commercial tools like Magnet AXIOM and Belkasoft, high training costs, infrastructure upgrades, and personnel limitations from high investigator caseloads restrict full implementation, addressed through prioritization of free open-source tools and phased implementation spreading costs over time (Huang & Chuang, 2007; Hu et al., 2005).

Self-reported data may include social desirability bias and overestimation of ICT skills despite 93.7% claiming formal training, while cross-sectional design collecting data at one-point (January 2022-July 2025) limits understanding of perception changes over time and long-term impact assessment, partially mitigated through triangulation with document analysis (Davis, 1989; Venkatesh et al., 2003).

Limited diversity in validation sample with 30 experts geographically limited to Kampala Metropolitan Area from Uganda Police Force homogeneous professional backgrounds, and structured walkthrough sessions lasting 45-60 minutes may not allow deep reflection, with participants having not used the framework in practice limiting practical validation.

7.3 Recommendations.

Based on the study findings, validation results, and identified limitations, the following recommendations are provided for successful framework implementation across immediate, short-term, medium-term, and long-term horizons.

7.3.1 Short-Term Actions (Months 1-6)

Recommendation 1: Establish a National Policy Framework This critical priority creates legal foundation by developing comprehensive policy framework addressing legal ambiguity concerning 65.8% of respondents within 6-12 months through Ministry of Internal Affairs and Uganda Police Force, providing clear legal framework removing uncertainty and empowering investigators to conduct digital investigations with confidence in evidence admissibility (Gandy, 2020; Congressional Research Service, n.d.; Bureau of Justice Assistance, 2013).

Recommendation 2: Secure Dedicated Budget and Resources This high priority enables implementation by developing detailed budget proposal covering personnel, technology, infrastructure, training, and operational costs, advocating for allocation to Parliament Finance Committee demonstrating ROI through faster investigations and crime reduction, and establishing dedicated budget line preventing fund reallocation within 3-6 months, addressing resource limitations identified by 52.5% of respondents (Huang & Chuang, 2007; Hu et al., 2005; Braga, 2021; Policing Bureaucracy Task Force, 2005).

Recommendation 3: Pilot Adoption in Old Kampala Division This high priority tests framework before scale-up in Old Kampala with highest crime rate (4,314 cases in 2022) through 12-month pilot cycle including operations phase (months 4-9) applying framework to 10-20 cases and conducting weekly debriefs, evaluation phase (months 10-12) analyzing KPIs and surveying stakeholders, targeting 30% investigation time reduction, 25% suspect identification increase, 90% evidence admissibility, and 75% investigator satisfaction (Davis, 1989; Venkatesh et al., 2003; Hevner et al., 2004).

7.3.2 Long-Term Actions (Months 7-18)

Recommendation 4: Develop Comprehensive Training Program This high priority addresses limited expertise concerning 38.9% of respondents and low confidence (55.1%) by developing standardized curriculum covering foundation, advanced, and specialized levels, training-of-trainers using top pilot performers, delivering 2-week foundation training through monthly cohorts of 20-25 investigators targeting 200 Kampala investigators, deploying online platform with 10 initial courses accessible via mobile with gamification, and establishing Digital Investigator certification requiring exam passage and annual recertification, achieving 80% of Kampala CID investigators trained within 18 months (McAfee Institute, 2025; BPRD India, 2022; Datastat Training Institute, 2025; Blue to Gold, 2025).

Recommendation 5: Establish Partnerships with Social Media Platforms This medium-high priority enables faster data access by initiating contact with Meta's Law Enforcement Response Team for Facebook/Instagram/WhatsApp, X Corp for Twitter emergency disclosures, ByteDance for TikTok, and Google for YouTube, negotiating service agreements securing expedited responses for urgent cases, direct liaison contacts, free training, and early policy change warnings, standardizing legal request process with templates and approval procedures, and ensuring compliance with platform Terms of Service within 6-12 months through Uganda Police Legal Department (Congressional Research Service, n.d.; Brennan Center for Justice, n.d.).

Recommendation 6: Establish Secure Evidence Storage System (D14) This high priority ensures digital evidence integrity and proper chain of custody addressing evidence destruction concerns of 58.4% of respondents by implementing secure storage infrastructure with RAID configuration, backup systems, digital evidence management system with AES-256 encryption, role-based access control with multi-factor authentication, chain of custody protocol from collection through hash calculation to audit trail, retention policy (10 years convictions, 5 years acquittals), and court preparation producing complete evidence packages with hash values and verification reports (Angus-Anderson, 2016; Bosco Legal, 2024; SMI Aware, 2025; VIDIZMO, 2025; Jatheon, 2025).

7.4 Suggestions for future studies

Further studies can focus on the suggestions below.

Technology Integration: Further research could also look at the possibility of investigating the integration of emerging technologies like artificial intelligence, and machine learning with social media platforms for advanced crime analysis and prediction. This research could explore how these technologies can enhance decision-making processes and operational efficiencies in the police sector with a goal of predictive analysis and decision making.

Longitudinal Studies: Conducting longitudinal studies to track the evolution of social media adoption in crime investigation over time within the police force. This could involve examining changes in adoption rates, usage patterns, effective metrics, and challenges faced by the police force while using social media for crime investigations.

Comparative Analysis: Future studies can also compare the adoption and impact of social media in crime investigation across different countries, regions, or types of law enforcement agencies such as courts of law, military, among others. The comparison could be (urban vs. rural, federal vs. local). This comparative approach can highlight best practices, cultural differences, country centric practices, and contextual factors influencing adoption of social media in crime investigation.

Exploring the above research directions can contribute to a deeper understanding of how social media can be effectively harnessed to improve crime investigation practices while addressing associated challenges.

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Appendix 1: Research Budget

No.	Items	Amount (UGX)
1	Transport	400,000
2	Stationery	250,000
3	Data Collection/ Assistant research	400,000
4	Meals	700,000
5	Airtime	200,000
6	Internet	500,000
7	Printing charges	400,000
8	Binding Charges	150,000
9	Miscellaneous	500,000
	TOTAL	3,500,000

Appendix 2: Research Work Plan

Research Activity	Jan - August June 2023	August 2023	May 2024	June 2024	July 2024	Aug- Nov 2024
Writing and submitting the proposal						
Proposal submission						
Data Collection						
Data Analysis						
Writing of the dissertation						
Making dissertation edits and submission						
Dissertation presentations						

Appendix 3: letter of authorization

MAKERERE

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COLLEGE OF COMPUTING AND INFORMATION SCIENCES

SCHOOL OF COMPUTING AND INFORMATICS TECHNOLOGY

21st November, 2023

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

**RE: INTRODUCTION LETTER FOR MR. ADUPA BOB BRUNO REG.NO.
2021/HDO5/2265U**

This is to introduce Mr. Adupa Bob Bruno a student of Makerere University pursuing a Master's degree in Information Technology at the School of Computing and Informatics Technology, Makerere University.

Adupa is currently undertaking a study titled: "A framework for adoption of social media in crime management: Case of Uganda police Force in metropolitan Kampala "as part of the requirements for the award of Master's degree in Information Technology. This research is under the supervision of Dr. Agnes Rwashana Semwanga an Associate Professor at the School of Computing and Informatics Technology.

Any assistance accorded to him in the process of data collection is highly appreciated.

Sincerely,

Dr. Joseph Balikuddembe

DEAN

Email: dean.scit.ac.ug

Appendix 4: Questionnaire

Graduate Research Survey on the adoption of social media for crime investigation

Dear valued respondent,

My name is Adupa Bob Bruno, a student of Makerere University, pursuing a Master of Information Technology. My research topic is a framework for the adoption of social media in crime investigation case of Uganda Police Force in the metropolitan Kampala. This questionnaire is intended for frontline officers, IT staff, social media users, officers handling crime intelligence and investigations.

This research aims at assisting the Uganda police force minimize on the delays experienced in crime responses, identification, investigation, reporting, and management by providing the adoption framework that the police sector can adopt for crime investigation using social media. This will be achieved by exploring the challenges associated with crime investigation and proposing solutions that address the identified challenges.

To complete this study, I kindly request about 10 minutes of your time to complete the survey below.

NOTE:

Data collected here is confidential and will only be used for this study.

Average Completion time: 8 - 12 mins

Participation in this study is voluntary.

Thank you for your participation.

brunoxeran@gmail.com/ 0780259446

* Indicates required question

Bio Data *

1. Your role in this Organization.

2. How long have you held this position *

3. Your Age Group *

Mark only one oval.

20 -25

26 -30

31 - 35

36 - 40

41 - 45

46 - 50

Above 50

4. Your Work Experience range * *Mark only one oval.*

0 - 5

6 - 10

11 - 15

16 - 20

Above 20

5. What is your gender? * *Mark only one oval.*

Male

Female

6. What is your highest level of education * *Mark only one oval.*

PHD Holder

Master's Holder

Bachelor's Holder

Diploma Holder

Other:

Social media literacy

1. How long have you used social media? * *Mark only one oval.*

0 - 2yrs

2 - 4yrs

4 - 6yrs

6 - 8yrs

Above 8 yrs.

2. Have you had any formal training in use of social media * *Mark only one oval.*

Yes

No

3. How do you access social media related platforms? *

Check all that apply.

Mobile Phone

Personal Laptop/ desktop

Company laptop / desktop

Other:

4. Has social media been used in reducing and investigating criminal activity? *

Mark only one oval.

Yes

No

Maybe

5. If yes, how have they been used to reduce and manage crimes?

6. What is your computer literacy level *

Mark only one oval.

Very High

High

Medium

Low

Very Low

7. What social media applications /sites do you use *

Check all that apply.

WhatsApp

Facebook

TikTok

Instagram

YouTube

Snapchat

Other:

8. How often do you use social media *

Mark only one oval.

- Never
- Occasionally
- Sometimes
- Often
- Always

Perceived usefulness

1. Using social media for crime investigation would reduce the time lags involved in dissemination information to the public *Mark only one oval.* *

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

2. Using social media will allow the police to follow up on regular updates to the public *

Mark only one oval.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

3. The use of social media in crime investigation will assist in rapid retrieval of criminal* information.

Mark only one oval.

- Strongly disagree.
- Disagree
- Neutral
- Agree
- Strongly agree.

4. Using social media for crime investigation would improve how crimes are handled?

Mark only one oval.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

5. Having a social media guideline will assist in streamlining and guiding how social media * related activities are handled *Mark only one oval.*

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly disagree.

Perceived ease of use

1. Would social media platforms be easily used to investigate crimes *

Mark only one oval.

- Strongly disagree.
- Disagree
- Neutral
- Agree
- Strongly agree.

2. What are the perceived benefits of using social media for crime investigations?

- Access at anytime
- Ease and clarity for constructive use.
- Easy to use and navigate.
- Easy of doing what you want to do.
- Attractive to use
- Well structured to suit investigator needs.

3. Using social media for crime investigation would help me become skillful in managing *

criminal activities

Mark only one oval.

- Strongly disagree.
- Disagree
- Neutral
- Agree
- Strongly Agree

4. My Interaction with use of social media for crime investigation would become clear and * understandable.

Mark only one oval.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

5. I would find it easy to retrieve criminal data on social media *

Mark only one oval.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly disagree.

User satisfaction

1. How satisfied are you with the current social media usage for crime investigation *

Mark only one oval.

- Strongly agree (very satisfied)
- Agree
- Neutral
- Disagree
- Strongly Disagree (Very dissatisfied)

2. I feel very confident in using social media for crime investigations *

Mark only one oval.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly disagree.

3. Using social media for sharing information to the public is very quick and reliable *

Mark only one oval.

- Strongly disagree.
- Disagree
- Neutral
- Agree
- Strongly agree.

4. I am satisfied with using social media platforms to manage criminal activities *

Mark only one oval.

- Strongly agree.
- Agree
- Neutral
- Disagree
- Strongly Disagree

Behavioral intention to use and actual use.

1. I intend to use social media for crime investigation regularly *

Mark only one oval.

- Strongly agree.
- Agree
- Neutral
- Disagree
- Strongly Disagree

2. I think I would like to use social media for crime investigation always *

Mark only one oval.

- Strongly disagree.
- Disagree
- Neutral
- Agree
- Strongly agree.

3. It is easy to interact with social media while crime investigation *

Mark only one oval.

- Strongly disagree.
- Disagree
- Neutral
- Agree
- Strongly agree.

Benefits, challenges, and Methods

1. Please select the primary methods your agency currently uses for crime investigation *

(select all that apply)

Check all that apply.

- Data analysis
- community
- policing
- surveillance
- Informants
- Social media

Other:

2. What do you see as the potential benefits/ Usefulness of using social media in crime * management? (Select all that apply)

Check all that apply.

- Faster community engagement
- Faster dissemination of information public awareness
- crime reporting and prevention.
- Data Analysis and recognition
- Faster crime investigation
- Real time data

Other:

3. What are your primary concerns that hindered the adoption of social media in crime investigation? (Select all that apply)

Check all that apply.

- Privacy and data security
 - Misinformation and false reports
 - Legal and ethical considerations
 - Resource limitations
 - Lack of social media expertise
 - Public perception and trust
 - Awareness
 - Other:
-

4. How is social media content verified and authenticated to be from a credible source *
-

5. Suggest the success factors that can encourage successful the adoption of social media in * crime investigation.

Conclusion

Thank you for your participation in this survey! Your feedback will help us better understand the readiness and potential challenges law enforcement agencies may face in adopting social media for crime investigation.

Appendix 5: Validation questionnaire
VALIDATION QUESTIONNAIRE

Dear valued respondent,

My name is Adupa Bob Bruno, a student of Makerere University, pursuing a Master of Information Technology. My research topic is a framework for the adoption of social media in crime investigation case of Uganda Police Force in the metropolitan Kampala. This is intended for Crime experts, social media experts, IT managers, and policy makers within the police sector.

From the survey conducted in June 2024 about the adoption of social media in crime investigation. The analysis of the collected data revealed the following challenges and measures taken:

Challenges

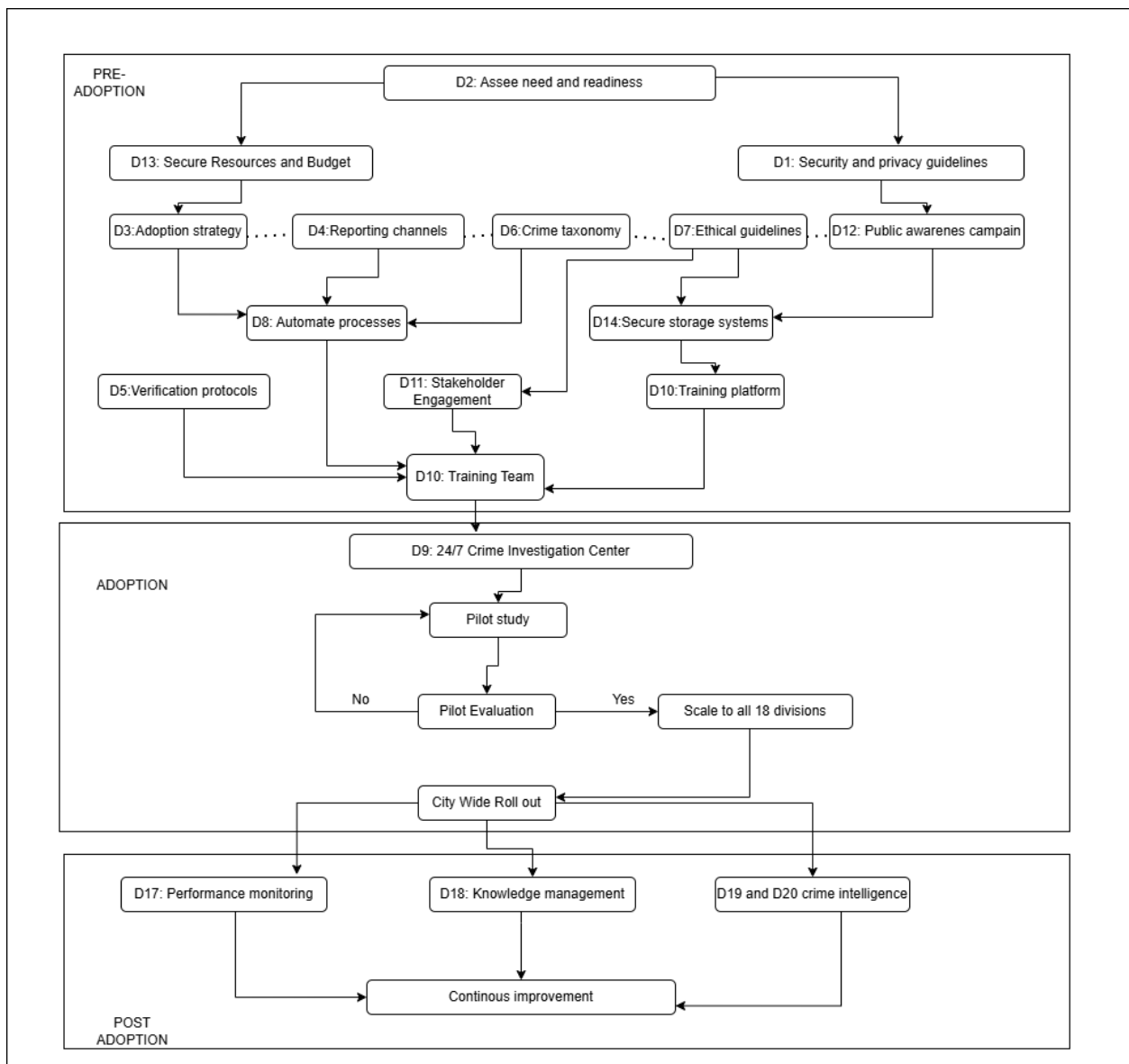
- C1: Privacy and data security issues
- C2: False reports and misinformation
- C3: Legal and ethical issues
- C4: Resource limitations
- C5: Limited social media experts
- C6: Public perception and trust issues
- C7: Low awareness
- C8: Evidence destruction
- C9: social control

Requirements/ guidelines

1. Establishment of security and privacy guidelines, regulations, and policies
2. Establishment of content verification methods
3. Re-alignment of Business the social media process in accordance with the social media act and computer misuse act 2011.
4. There should be Resource planning and allocation methods.
5. Consultation from experts and producing training programs.
6. Establishment of the adoption strategy for social media
7. Stakeholders and community should always be involved.
8. Producing awareness strategies and campaigns
9. Seeking Government support and top management
10. Establishment of secure Content storage and management strategies

To address the challenges, requirements were derived, and a framework was designed to guide on the adoption of social media in crime investigation. Based on the above challenges, kindly evaluate the framework presented for its applicability to being adopted.

Your response will be highly appreciated. The figure presented below is a visual illustration of the framework for the adoption of social media in crime investigation.



1. Please indicate by ticking appropriately on a scale of 1-5 depending on how much u agree.

Code	1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree	1	2	3	4	5
Functionality						
F1	The framework addresses the challenge of privacy and data security issues identified in the research study by offering guidelines on establishment of privacy and data security regulations, guidelines, and policies					
F2	The framework addresses the challenge of Legal and ethical issues identified in the research study by suggesting Establishment of ethical guidelines					

F3	The framework addresses the challenge of resource limitations identified in the research study suggesting Establishment of Resource planning and allocation strategies					
F4	The framework addresses the challenge of Limited social media experts' issues identified in the research study suggesting Establishment of Consultation and training programs					
F5	The framework addresses the challenge of public perception and trust issues identified in the research study suggesting stakeholder involvement as a measure					
F6	The framework addresses the challenge of Low awareness issues identified in the research study by offering a solution of Establishment of awareness strategies and campaigns					
F7	The framework addresses the challenge of Evidence destruction identified in the research study through offering a guideline of Establishing a secure Content storage and management strategies					
F8	The framework addresses the challenge of social control identified in the research study through Establishment of training sessions and platforms					
F9	The framework simplifies the adoption process by providing necessary guidelines for the identified challenges above					
F10	Overall, the framework is applicable for the adoption of social media in crime investigation					
Understandability						
U1	The framework for the adoption of social media in crime investigation has a well-defined structure and organization					
U2	The framework for the adoption of social media in crime investigation uses simple language					
U3	The framework for the adoption of social media in crime investigation has a visual representation of the components and their relationships					
U4	The framework for the adoption of social media in crime investigation provides a feedback mechanism through stakeholder's engagement					
U5	The framework phases are clearly defined (pre-the adoption, the adoption, and post the adoption)					
Traceability						
T1	The framework phases (pre-the adoption, the adoption, and post the adoption) are interdependent with each other					
T2	The design decisions (D1-D20) in the framework are logically related					
T3	The design decisions (D1- D20) of the framework can easily traced.					
Relevance						
R1	The framework addresses key challenges in crime investigation effectively					

R2	The framework aligns with current practices and procedures in our department.					
R3	The framework allows for integration with other crime intelligence systems					
R4	The framework allows for collaboration between departments					
R5	The framework aligns with the strategic objective of the police sector					
Practicability and Usability						
P1	The framework is clear and easily usable					
P2	The framework is easy to implement					
P3	The framework caters for scalability in terms of crime volumes					
P4	The framework meets the requirement Establishment of security and privacy guidelines, regulations, and policies					
P5	The framework meets the requirement Establishment of public awareness campaigns on the adoption of social media (Tools)					
P6	The framework meets the requirement of Establishing content verification strategies					
P7	The framework meets the requirement of ethical guidelines					
P8	The framework meets the requirement Establishment of Resource planning and allocation strategies					
P9	The framework meets the requirement Establishment of Consultation and training programs					
P10	The framework meets the requirement Engagement of stakeholders and community					
P11	The framework meets the requirement Establishment of awareness strategies and campaigns					
P12	The framework meets the requirement Establishment of secure Content storage and management strategies					
P13	The framework meets the requirement of Establishment of training sessions and platforms					
P14	The framework meets the requirement of Technology support and management					
P15	The framework meets the requirement of Performance monitoring, evaluation, and control					
P16	The Framework meets the requirement of Knowledge management					
Effectiveness and impact						
E1	I believe the framework will enhance our ability to gather intelligence through social media					
E2	The framework adequately addresses concerns regarding privacy and data security.					

E3	I foresee that implementing this framework will improve overall crime investigation outcomes					
----	--	--	--	--	--	--

2. Would you recommend the framework to other organizations? YES/NO

.....

3. Explain your answer above!

.....

4. What aspects of the framework do you find most beneficial?

.....

5. Are there any components of the framework that you find unclear or impractical?

.....

6. Do you have any suggestions for improving the framework?

.....

Thank you.