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INVESTIGATIONS OF FRAUD, WASTE, ABUSE, AND CORRUPTION IN THE PUBLIC
SECTOR: A SURVEY OF ORGANIZATIONAL AND SOFTWARE-BASED AIDS AND
OBSTRUCTIONS

by

LAWRENCE KOM

A dissertation submitted to the Graduate Faculty in Criminal Justice in partial fulfillment of the
requirements for the degree of Doctor of Philosophy, The City University of New York

2020

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This manuscript has been read and accepted for the Graduate Faculty in Criminal Justice in
satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

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ABSTRACT

INVESTIGATIONS OF FRAUD, WASTE, ABUSE, AND CORRUPTION IN THE PUBLIC SECTOR: A SURVEY OF ORGANIZATIONAL AND SOFTWARE-BASED AIDS AND OBSTRUCTIONS

by

Lawrence Kom

Advisor: Professor F. Warren Benton

Fraud, Waste, Abuse, and Corruption present significant challenges to the efficient use of public resources and stifle government service improvement by detracting from policy development and undercutting funding for important initiatives. The purpose of this study is to better understand the aids and impediments to investigations of these offenses and provide a generalizable definition for the mission of Inspectors General, the group tasked with monitoring and addressing these offenses. This study also sought to identify the material role of software in investigations of Fraud, Waste, Abuse, and Corruption. Through a purposive sampling, 18 Inspectors General from the federal, state, and local level were interviewed using the Critical Incident Technique to help recall cases investigated that they found significant. For each case data was collected on the significance criteria for being included, whether the investigation was thorough and unimpeded, and what outcomes were achieved. A quantitative analysis revealed no correlation between whether it was a thorough investigation and the achieved outcomes. A second quantitative analysis showed a strong relationship between material software support and outcomes of a legal nature. For qualitative analysis a theme analysis of the self-described role and responsibilities of investigators was conducted, offering a generalizable goal of: *Investigating and rooting out fraud, waste, and abuse*, and a more inclusive: *Prevent, investigate, and root out fraud, waste, abuse, misconduct, and corruption to preserve or restore efficiency*. Participants in the study diagnosed case significance as primarily egregious cases that betrayed a public trust or impacted a vulnerable group. Primary obstacles to thorough investigations were suspect cooperation, political, evidence quality, jurisdictional, bureaucratic, legal limits, limited skillsets, scope, and understaffing.

TABLE OF CONTENTS

List of Tables	vi
List of Figures	vii
Chapter 1: Introduction	1
Problem Statement	1
Inspector General Function	3
Workarounds to Investigation Impediments	3
Research Questions	4
Chapter 2: Literature Review	6
Fraud, Waste, Abuse, & Corruption	6
Inspector General Function	7
Auditing and Investigational Software	8
Situational Crime Prevention	11
Chapter 3: Methodology	15
Research Method and Design	15
Critical Incident Technique	16
Internal Validity	17
In-person/Phone Interviews	17
Survey Instrument	19
Analysis & Models	25
Chapter 4: The Results	29
Questions 1 and 2: Respondent Background	30
Questions 3: Significance of Case	31
Questions 4: Thorough Investigations	34
Question 5: Case Specifics	40
Question 6: Software role	41
Question 7: Outcomes	42
Chapter 5: Analysis & Findings	45
Summary	45
Outcomes	45
Inspector General Role	51
Case Significance	52
Obstacles	52
Software	53
Chapter 6: Implications, Limitations, & Conclusion	59
Research Questions	59
Implications	61
Limitations	62
Future Research	63
Conclusions	63
Appendix A: Recruitment Script	66
Appendix B: Informed Consent Form	67
Appendix C: Survey Instrument	70
Appendix D: Tables & Figures	73
References	111

List of Tables

Table 1. Total respondents, cases collected by type.....	30
Table 2. Respondent employment and organizational attributes.	31
Table 3. Matching cases by reason for significance.....	32
Table 4. Matching cases by macro reason for significance.....	34
Table 5. Total cases, critical success or failure, and success rate by type.	34
Table 6. Total cases, critical success or failure, and success rate by type, for cases not pending outcome only.	35
Table 7. Obstacle themes and matching case counts.....	35
Table 8. Obstacle themes and specific obstacle breakdowns.....	38
Table 9. Types of software used for each case.....	42
Table 10. Case outcomes by case type with no pending additional outcomes.	43
Table 11. Case outcomes by case type with no pending additional outcomes as percentage of total outcomes for each outcome type.....	43
Table 12. Case outcomes by case type with pending additional outcomes.	44

List of Figures

Figure 1. Breakdown of respondent job positions.29
Figure 2. Total cases of Fraud, Waste, Abuse, and Corruption collected.30
Figure 3. Fraud, waste, abuse, and corruption cases investigated by year.40
Figure 4. Fraud, waste, abuse, and corruption cases by financial amount missing or in question.
.....41
Figure 5. Thematic analysis of investigator mission.51

Chapter 1: Introduction

The purpose of this research study is to better understand the aids and impediments to investigations of Fraud, Waste, Abuse, and Corruption. The results of this study may aid in the development of new investigative techniques and increase awareness of aids and obstructions to investigations of this manner.

This study employed an in-person or over the phone survey with acting or former investigators of Fraud, Waste, Abuse, and Corruption in local, state, or federal government positions. The respondents were approached at two conferences, 3 years apart, where investigators met through a professional association. The survey instrument covered questions on background including scope of their organization, authority, and their perceived mission. The survey then employed the Critical Incident Technique to assist the respondents in recalling details about cases they investigated in their role that resulted in critical success or failure as well as their definition for such success.

For each case, qualitative and quantitative factors were recorded and modeled for a binary logistic regression analysis using critical success as the dependent variable, defined by the respondent's assertion that a thorough investigation was able to be conducted without significant obstacles. Qualitative analysis conducted on the data set sought to model the Fraud, Waste, Abuse, and Corruption investigator's perception of their role and accomplishments through the Retributive Justice model.

Problem Statement

Fraud, waste, abuse, and corruption are the use and misuse of public resources for purposes not contingent with the mandate of the role of the official or contractor that was tasked or sourced to provide public service. These offenses typically overlap and are used contingently with each other in an effort to disguise ongoing infractions or advancing an existing scheme. At their core definitions, these offenses stoke distrust at all levels of an organization, while each may provide specific injury.

Cases of fraud, defined in this study as the intentional deception committed to conceal actions or transactions, violate public trust and challenge future budgetary discretion and support for the impacted groups. Fraud cases act as a reminder to public sector officials and their constituents that lying, cheating, and stealing can occur at every level of an organization and injure the goals and morale of those dependent on the integrity of the organization; both as participants and recipients.

Cases of waste, defined in this study as the use of financial and material resources or personnel for purposes not directly related to the execution of duties and responsibilities of the organization, demonstrate areas requiring additional oversight as well as stricter criteria for spending, and further damage trust in the public sector use of finite resources.

Cases of abuse, defined in this study as the misuse, allocation or improper treatment of financial or material resources or personnel to perform tasks and activities which may be directly or indirectly related to the execution of duties and responsibilities of the organization, produce results counter to the mandate tasked and damage confidence in the level of authority given to the role or organization.

Cases of Corruption, defined in this study as the use of power for activities not authorized by the position, envelops the aforementioned Fraud, Waste, and Abuse, using each to further agendas that defy if not attempt to hinder the success of publicly mandated goals and attitudes. Corruption among officials as well as vendors of government services create an unfair market, an inequality in treatment by bureaucracy, and attack the integrity of the institutions as trusted benefactors for public good.

Tasked with combatting these perils for organizations, Inspectors General have been historically understaffed, under-resourced, and hindered by bureaucracy in pursuit of their mandated mission to preserve and restore efficiency in organizations. At the time of this study there is not adequate research on the topic that conducts specific interviews to identify the specific impediments that these investigators observe and how they overcome or are hindered by these obstructions.

Inspector General Function

This study uses titled Inspectors General as a representative proxy group for watchdogs and oversight roles tasked with combatting Fraud, Waste, Abuse, and Corruption in public affairs. Inspectors General are responsible for defending against these offenses at the federal, state, and local levels. According to Harris (2012) in *Inspectors General: Exploring Lived Experiences, Impediments to Success, and Possibilities for Improvement*, despite there being significant financial savings produced by Inspectors General, there are also significant external forces that tamper the potential outcomes from these efforts, including budgetary limits on their work, political interference, and insufficient authority to conduct thorough investigations.

The Inspector General Act of 1978 mandated the appointment of Inspectors General (IGs) in the federal government by the President with advice and consent from Congress. Inspectors General were prescribed to be independent and selected not based on political affiliation but integrity and demonstrated investigatory skills relevant to identifying misuse of public resources in a variety of accounting or management scenarios. Coming from a broad background, Inspectors General also needed specific knowledge for the organization or agency they would be tasked with investigating and monitoring, as each will have nuances and important distinctions in services scoped and process. (Harris, 2014)

This study sought to diagnose specific obstructions experienced by Inspectors General at the federal, state, and local level, as well as potential workarounds employed to combat these impediments. From the qualitative side, this study also sought to identify common understandings of mission from Inspectors General as each office has chartered their goals in different language and with different scope and needs.

Workarounds to Investigation Impediments

Given the aforementioned impediments to successful completion or perceived successful outcomes, this study's survey instrument requested specific details on which impediments investigators observed as well as if and how they were able to work around these obstacles. A specific emphasis was also placed on the role that software plays in materially assisting an

investigation and which specific software tools and features may have aided or been desired in their work.

Research Questions

This study sought to obtain answers to five (5) research questions surrounding investigators of Fraud, Waste, Abuse, and Corruption. The methodology for obtaining these answers is described below for each question.

1. What outcomes are correlated with a successfully thorough investigation?

This study sought to understand what outcomes are contingent with cases identified as successfully thorough by Inspectors General. This is accomplished through use of the Critical Incident Technique to draw out cases that the investigators consider significant and attribute specific outcomes to those cases.

The Critical Incident Technique requires respondents to characterize incidents they observed in the context of success and failure. Respondents are asked to recall cases that occurred that match the characteristic of success or failure related to accomplishing a critical task. This study requested that respondents define what made each case significant, whether a thorough investigation was able to be conducted, and what outcome(s) occurred.

This question is addressed by a number of binary logistic regressions using coded categorical outcomes discovered during the interviews. The included outcomes are a known list of likely outcomes for Fraud, Waste, Abuse, and Corruption cases, along with General Theory informed outcomes learned from respondents. This list is further coded down to reduce the number of possible dependent variables to ensure statistical significance within the available data set and analysis. At the outset, the included outcomes include Legal (Arrest, Criminal Charges, Indictment, or Conviction), Financial Recovery (whether any of the survey instrument scale values were recovered), and Termination (if the case resulted in terminations).

2. What do Inspectors General see as their role?

Each respondent recently served or was currently serving as an investigator of Fraud, Waste, Abuse, and Corruption. The survey requested that they provide the “general aim” of their

investigative office. This question is addressed by a qualitative analysis of these responses, looking at usage of terms and categorized by scope of mission.

- What is their common general aim?
- What makes cases significant?

3. What makes cases significant to Inspectors General?

As per Question 2, this study requested that respondents define what made each case significant during the course of the Critical Incident Technique exercise. The responses from Question 2 regarding what makes a case significant were then coded and thematically grouped as factors that investigators shared as qualifying for significance.

4. What impedes a thorough investigation?

With each investigation that the respondents recalled, this study requested details of what, if any, obstacles occurred during the course of the investigation that prevented a thorough investigation from being conducted. Prevention of a thorough investigation was coded as Critical Success or Failure for the purposes of the Critical Incident Technique and regression analysis. This particular question is addressed with a qualitative analysis and categorization of the types of impediments these investigators commonly experienced in significant cases.

In the course of the survey there was a natural explanatory narrative that occurred with each case and with each investigator as they gave open-ended answers to some the survey questions. Future study in this area would be served well by explicit request for workarounds but it was not in the intended scope of this study. This study does seek software-based workarounds when applicable.

5. Is software material to the successful completion of investigations?

The survey requested specific information about the use of software by investigators during each investigation, whether it was material to the investigation, and which features they found useful. The survey also requested the respondents to share whether there were specific software features that could have been useful in each investigation.

Chapter 2: Literature Review

Fraud, Waste, Abuse, & Corruption

Investigations of fraud, waste, abuse, and corruption in the public sector have been occurring in the United States since nearly its founding. The United States Postal Service created the first investigative position in 1772, known as Surveyors, later becoming Postal Inspectors, to investigate theft by those entrusted with US mail. The first Surveyor was appointed in 1775. In 1872 Congress enacted the Mail Fraud Statute further institutionalizing the effort to combat misuse of the government-backed postal system in the wake of post-civil war scams. (United States Postal Inspection Service, 2019)

At a more local level, New York State created the Office of the Commissioners of Accounts in 1873 in response to hundreds of millions of dollars taken from New York City during the Tammany Hall scandal. This office later became known as the New York City Department of Investigation (DOI). DOI was granted subpoena power and administering oaths in 1884, enhancing its investigative capabilities. DOI's described mission is to attack corruption through investigations leading to "high-impact arrests, preventative controls, and operational reforms". (New York City Department of Investigation, 2019).

Collectively, the actions performed by these investigators have been labeled *fraud examination*, ending in reports of the investigations that successfully reconstruct past events and provide justification for conclusions. (Gottschalk, 2019). These investigators may be public servants, internal investigators, or private external investigators mandated by government to perform investigations into the client organization. (Gottschalk, 2017) Investigators conduct their work by collecting information from a variety of sources such as interviews with suspects, document and email searches, and direct observation of actors. When a final report is published it should have relevant consequences and justified conclusions. (Gottschalk, 2019).

While fraud reflects cover-up of theft, waste can be intentional or attributed to negligence, and abuse is the misuse of authority, corruption overlaps and may encompass the former crimes. Rose (2018) in *The Meaning of Corruption: Testing the Coherence and Adequacy of Corruption*

Definitions, states that a variety of definitions are advanced internationally for what corruption is but they suffer from incompatibility and weaknesses in scope. According to the Association of Certified Fraud Examiners (ACFE) *2018 Global Study on Occupational Fraud and Abuse: Report to the Nation: Government Edition*, 47% of common occupational fraud schemes in government agencies constituted corruption.

Further, different agencies and organizations are subject to different types of fraud, waste, and abuse risks and require investigators to take on a variety of roles. Elder (2018) outlines these roles as: (1) psychologist; understanding how and why someone may be drawn toward dishonesty, balancing pressure, opportunity, and rationalization (2) assessor; performing risk assessments unique to the organization, (3) controls expert; ensuring effective mitigations and internal controls are established, (4) translator; establishing common understandings between parties, (5) trainer; maintaining effective education on controls and ethics, and (6) sheriff; both through enforcement and deputizing organization members to seek out fraud.

Inspector General Function

Passed following the Watergate scandal, the Inspector General Act of 1978 was created to increase transparency and accountability in US government agencies. Inspectors General were tasked with remaining independent and objective during this work. (Social Security Administration, 2019) Since its inception, billions of dollars have been recovered on behalf of the federal government or spent more efficiently. (Apaza, 2014)

According to *Inspectors General: Exploring Lived Experiences, Impediments to Success, and Possibilities for Improvement* (Harris, 2012), Inspectors General are the signature line of defense against fraud, waste, and abuse in federal programs. *The Inspector General: Political Culture and Constraints on Effective Oversight* (Feldman, 2017) further explains that these investigators are tasked with capacity-building, performance-enhancement, and compliance monitoring responsibilities.

Inspectors General roles and responsibilities vary by prescribed legal mission and by jurisdiction. Although two offices may have the same titles or labels, they may be enabled in different ways. The Harris (2012) research covered both Federal and non-Federal Inspectors

General, while the Feldman (2017) research delved into what international incarnation of this activity could look like. The primary definition used by these studies to explain the mandate of the Inspector General role was to combat fraud, waste, and abuse as a means of improving efficiency.

Countering this mandate, Inspectors General are limited by budget, independence, and are vulnerable to political influence. Their work is largely misunderstood and unknown by the public. Harris's research uncovered that Inspectors General challenges include limited influence over their own budgets, limited ability to hire, and limited subpoena power, which he defined as budgetary and structural inadequacies. Highlighting stakeholder communication as a significant proponent to investigator success, this research helps illustrate the adaptation of each office's mission and tactics towards their tasked jurisdiction. (Harris, 2012)

According to Feldman (2017), there are also significant constraints on Inspectors General power manifested by an institutional distrust written into the constitutional structure, as well as a surveyed distrust that while encouraging compliance-monitoring, discourages capacity-building and performance-enhancement. Feldman classified these constraints as coming from two directions, one to expand power in the face of reprisal; the other to curtail and limit based on unchecked power or unlimited independence.

According to Johnston in *Coherence, Contrasts, and Future Challenges for Inspectors General* (2010), battling corruption naturally diminishes the support that Inspectors General receive, both politically and institutionally, as they isolate themselves and disrupt status quo to meet their independent watchdog requirement. Questioning how high profile the role should be, Johnston cites benefits for media exposure but also a common public distrust in government that manifests for all publicly visible roles. Further, the finding of corruption undercuts the Inspectors General perceived success as corruption was not prevented.

Auditing and Investigational Software

Internal controls form a significant component of fraud detection and prevention, regardless of being manual or computer-based. Auditing controls respond to attacks and failures of control systems and are also employed as routine and periodic review mechanisms—each with

their own specific vulnerabilities and risks for subversion. (Mercuri, 2003) Over the past 20 years there has been a shift in control system software, as organizations have moved towards all-inclusive enterprise-wide software known as Enterprise Resource Planning (ERP) systems; previously known as Office Information Systems (OIS). (Bailey, Whinston, & Zacarias, 1989) Essentially large-scale relational database management systems, they include Embedded Auditing Modules (EAMs) that provide substantive auditing capacity. Study has shown that EAMs are not effectively deployed by small, medium, and large organizations alike, primarily due to a lack of demand from ERP purchasers. (Debreceeny, et al, 2005)

ERP systems employ the resource-event-agent (REA) model of relational database structuring, which identify specific resources being managed, the transactions or events that are occurring in regards to those resources, and the personnel or entities involved in the transaction. Policy-level definitions enable the semantic construction of REA structures, organized through typification based on specific tasks, activities, and transactions conducted by an organization and then grouping them according to the characteristics of these events. (Geerts & McCarthy, 2006) Study has shown that managers place a greater degree of importance on administrative controls than the actual database designers. (Doty, Sen, & Wang, 1989)

In regard to these ERP systems, Grabski, Leech, and Schmidt (2011) reviewed past ERP research, concluding that there are still many problematic issues to be studied. They organized research by organizational impact, economic impact of the ERP system, and critical success factors. This overview focused on accounting mechanisms but raised concerns that there is a lack of research on risk management, regulatory issues, internal and external economic impacts of ERP systems, interorganizational support, design deficiencies for management control, and extensions needed for formats such as XBRL (eXtensible Business Reporting Language).

Previous studies have evaluated internal control effectiveness in regards to use of penalties as controls (Barra, 2010), how audit firm size accounts for automated and non-automated internal control effectiveness (Janvrin, Bierstaker, & Lowe, 2009), and the role of internal control training and education on management and employees—with a significant amount

of interest in technological compliance with Sarbanes-Oxley Act of 2002. (Klamm & Watson, 2009; Wallace & Cefaratti, 2011)

The majority of the research conducted in this field however, has been in regards to training and education, covering experiential learning effects (Eining & Dorr, 1991), how effective expert system frameworks are for internal control design (Brown & Murphy, 1990; Vinze, Karan, & Murthy, 1991), Accounting Information System (AIS) coursework in the United States (Groomer & Murthy, 1996; Bain, Blankley, & Smith, 2002), training and experience as an explanation for how auditors evaluate automated and non-automated controls (Viator & Curtis, 1998), electronic open exchange platforms for internal control methods and procedures (Lee, Dutta, Henry, & Nguyen, 2007), reviews of auditor understanding and usage of information systems (Burton, 2000; Jackson, 2000; Curtis, Jenkins, Bedard, & Deis, 2009), as well as research literature reviews of decision-making, governance, operations, and technology (PGOT) such as ERP systems. (Grabski, Leech, & Schmidt, 2011; Neely & Cook, 2011)

In studying the extent to which these internal control systems have been evaluated, a number of discussions have emerged among experts as to the correct methodology to evaluate control system effectiveness, particularly when group dynamics are involved. A piece in 2000, published in the Journal of Information Systems, suggested that group decision making around internal controls is flawed because only information known by the entire group will end up going into the decision making process. (O'Donnell, Arnold, & Sutton, 2000) Countering this argument, Carnaghan suggests that the O'Donnell, Arnold & Sutton study presumed equivalent base knowledge by the group members and did not take into account delegation of tasks. (Carnaghan, 2000)

Another reply to the discussion suggests that subjective responses to a questionnaire, as employed in the O'Donnell, Arnold, & Sutton study do not align with the high level requirement of controls system risk assessment. (Leech, 2000) In a rebuttal to these remarks, the original authors of the study offer their methodology for evaluation as an alternative to control system risk assessment, provided that all elements of the subjective narrative are documented and controlled for. (O'Donnell, Arnold, & Sutton, 2000) A 1999 piece by Curtis & Borthick recommends

organizing further by control objective—isolating out the area that is likely to be targeted by fraud or abuse. (Curtis & Borthick, 1999) Other research indicates that determining or quantifying those control points that should be emphasized must be the first step in an internal control audit. (Fields, Sami, & Sumners, 1986) The purpose of these audits should be to assess control risk that may affect subsequent detection risk. (Wu & Hahn, 1989)

While a number of studies have looked at specific information system-based internal control activities (Burton, 2000; Jackson, 2000), training in these systems (Curtis, Jenkins, Bedard, & Deis, 2009), and reliance by auditors on information system techniques (Viator & Curtis, 1998); only one significant study has been conducted regarding specific activity usage. In the 2009 Janvrin, Bierstaker, & Lowe study, various factors were observed to influence which specific internal control activities were conducted, with special concern paid to computer-related auditing procedures. (Janvrin, Bierstaker, & Lowe, 2009) At this time there is no known study that evaluates perceived effectiveness of internal controls.

Situational Crime Prevention

As this subject area employs the use of control systems to mitigate a perceived expected level of risk or error, an ideal criminological platform to frame the research would be Situational Crime Prevention (SCP). This theory, originating in 1980, is a child study area of Environmental Criminology and the policy response to identifiable defensive spaces and the corresponding offenses committed there. (Clarke, 1980; Clarke & Mayhew, 1980) Through the identification of potential weak physical zones where crimes will be afforded a greater opportunity for commission, designers and architects can utilize SCP to generate safety in existing problem environments. Fundamental to SCP is the acceptance that crime will occur if there is suitable opportunity, limited guardianship, and individuals who may rationalize the desire to commit the crime.

As framing theories, rational choice and routine activities theory are often cited as the appropriate background for promoting and developing defensible spaces. (Clarke, 1980, 1995, 1997) However there is an exception to the use of rational choice theory for guiding SCP

regarding crimes of expression, which this analysis will not include in the context of auditing information systems development. (Hayward, 2007) Generally SCP has been used to study physical locations such as public spaces, housing complexes, and transportation facilities. This analysis expands the usage of SCP, as other researchers have, to include non-physical locations or “virtual environments” that auditing information systems may offer substantial protections for. (Kapardis & Krambia-Kapardis, 2004; Willison & Siponen, 2009; Pratt, Holtfreter, & Reisig, 2010)

Although Environmental Criminology encompasses a wide array of studies and theoretical challenges when used to explain why crime is committed, the focus of how crimes are committed arise through the study area of Crime Prevention Through Environmental Design (CPTED) which in turn spawns SCP as the policy response to existing problem areas. C. Ray Jeffery originally coined the term CPTED in 1971, however it comes from a long line of researchers focused on urban decay and the powers of surveillance to remediate crime opportunities. (Jeffery, 1971; Wortley, Mazerolle, Cozens & Clarke, 2008)

Notable to the development of CPTED studies is the work of Oscar Newman who conceptualized “defensible space” in 1973 while observing separate housing complexes whose designs promoted and discouraged crime distinctly. Defensible space encourages designs that enhance territoriality between public and private spaces through barriers, both symbolic and physical. To prove out these claims, Newman performed a quantitative analysis based on crime rates which has since been largely refuted for its unscientific nature and generalizations that insisted crime was caused by the housing designs rather than the characteristics of the residents. His later research has acknowledged that the resident’s characteristics are a greater predictor of crime rate, while maintaining the role that environmental design plays in how crimes are afforded the opportunity to occur. (Wortley, Mazerolle, Cozens & Clarke, 2008)

According to Newman, defensible space is comprised of four elements or capacities that act individually and comingle: (1) to create perceived zones, (2) to provide surveillance opportunities, (3) to reduce the perception of isolation, stigma, or uniqueness, and (4) to juxtapose safe areas to influence the safety of adjacent areas.

Drawing on defensible space and behavioral psychology, CPTED encompasses three main strategies and three supplemental strategies. The primary three strategies are: (1) territorial reinforcement or barriers and access control, (2) natural surveillance or increasing the perception of being observed by residents, and (3) natural access control through spatial definition. The three supplemental strategies are: (1) activity support or the encouragement of positive use of spaces, (2) image/space management or simply keeping an area maintained, and (3) target hardening or micro application of access control. (Wortley, Mazerolle, Cozens & Clarke, 2008) Additional research in the CPTED field has spawned Wilson and Kelling's "broken windows" (1982), criminal use of CPTED as "offensible space", and an entire field of study dedicated to "designing out crime" or design against crime (DAC). (Wortley, Mazerolle, Cozens & Clarke, 2008; Jacques & Reynald, 2012) Other researchers, such as Alice Coleman still contend that design can cause crime, however for the purposes of this analysis the focus will be on crime opportunity. (Wortley, Mazerolle, Cozens & Clarke, 2008)

What makes Situational Crime Prevention (SCP) unique compared to CPTED and DAC is that it looks to existing problems rather than attempting to predict them. However, SCP along with Problem-Oriented Policing (POP) is informed by CPTED and DAC, which both look at what has worked in the past to prevent displacement at the outset. (Guerette & Bowers, 2009) Although initially challenged by the criticism that SCP will simply displace the crime it attempts to diffuse, displacement of crime has not proven to be a substantial problem as previously thought. (Clarke, 1995, 1997) As a crime control strategy, SCP offers valuable lessons to any existing crime-specific response area. (Wortley, Mazerolle, Cozens & Clarke, 2008) Further research on hot spot policing has promoted strategies that go beyond the work of SCP and are informed by Crime Pattern Theory where emphasis is placed on guardianship in the crime area, and Crime Opportunity Theory, which suggests that hot spots exist because criminals see them as practical targets. (Weisburd, 2009)

The research of Von Lampe (2011) suggests that in the case of organized crime and other spatiotemporal expansive crimes that are able to shape their environment to enable crime commission, SCP requires a significant number of framework enhancements. (Von Lampe, 2011)

As this analysis looks to apply SCP to auditing information systems that combat fraud, abuse, and corruption, it may also encounter similar spatiotemporal concerns.

Chapter 3: Methodology

Research Method and Design

This study employed an in-person or over the phone survey with acting or former investigators of Fraud, Waste, Abuse, and Corruption in local, state, or federal government positions. The respondents were approached at two conferences, 3 years apart, where investigators met through a professional association. The survey instrument covered questions on background including scope of their organization, authority, and their perceived mission. The survey then employed the Critical Incident Technique to assist the respondents in recalling details about cases they investigated in their role that resulted in critical success or failure as well as their definition for such success.

For each case, qualitative and quantitative factors were recorded and modeled for two regression analyses: 1) using critical success as the dependent variable in a multiple regression, and 2) using outcomes of cases as a multivariate regression. Qualitative analysis conducted on the data set sought to model the Fraud, Waste, Abuse, and Corruption investigator's perception of their role and accomplishments through the Retributive Justice model.

For security purposes and to encourage participant involvement, there were a number of concerns that needed to be addressed regarding the data collection and storage process. To this end, none of the phone conversations were recorded and all notes were hand-written, then transcribed, and finally shredded. The resulting data files were maintained on an encrypted hard drive utilizing the Apple "FileVault" feature. At the conclusion of this study, neither the jurisdictions nor the respondents were identified.

The instrument used to conduct the phone interviews was based on data collected from pilot questionnaires and committee consultation.

Data Reduction and Analysis Products

As directed by the Critical Incident Technique (CIT), this study procured one or more incidents from each phone interview, which were classified first by specificity, then be used to

contribute to the grounded theory improvement of the instrument, and finally categorized for later analysis.

Critical to the success of using the qualitative to quantitative reduction methodology offered by the Critical Incident Technique (CIT), this study maintains thorough documentation (Flanagan, 1954; Butterfield, Amundson, & Maglio, 2005) and reflexivity notes (Merton, 1948). Additionally, the intention of the study to improve auditing in public sector and private sector organizations was shared with the interviewees.

Strategies for Credible and Rigorous Research

In order to maintain credible and rigorous research, this study conducted careful purposive sampling (Patton, 1990) that was not convenience based, and member-checking (Lincoln & Guba, 1985) at the close of the interview, or in subsequent follow-up calls, to verify that details have been collected accurately with the interviewee.

Additionally, this study offers consideration of alternative explanations as well as clearly defined limitations. A complete discussion of Researcher Reflexivity (Merton, 1948) was conducted to avert the potential for undisclosed bias in the resulting analysis. The study addresses ethical concerns related to the subject material of fraud, waste, abuse, and corruption by passively collecting data on past cases. The study also addresses the risk for interviewees regarding exposure of potentially sensitive tasks and activities by anonymizing the data collection and sanitizing the analysis output.

Critical Incident Technique

As detailed by John C. Flanagan's *The Critical Incident Technique* (1954), the Critical Incident Technique is a product of the Aviation Psychology Program of the United States Army Air Forces during World War II, beginning in 1941. The program introduced a series of studies designed to identify characteristics of effective combat leadership. The technique developed called for requesting combat veterans to share incidents they had observed that they had found to be "especially helpful or inadequate in accomplishing the assigned mission." The purpose of

this technique was to overcome stereotypical and clichéd reasoning given by instructors when eliminating pilots from training schools.

By having respondents determine the difference between success and failure, researchers were able to identify the essential requirements necessary for a job and factors that led to the perceived failure to meet those requirements. Through first hand reports, the technique was effective in obtaining objective records of errors made by the respondents, errors made by superiors according to their subordinates, errors made by subordinates of respondents, and errors made by respondents as reported by their co-respondents. (Flanagan, 1954)

Internal Validity

To ensure internal validity, that the relationships observed by this study are not explained by alternative independent variables, this study:

1. Used purposive sampling to survey a representative sample
2. Recorded respondent's supplemental values and expanded categories through grounded theory.

In-person/Phone Interviews

The first series of In-person and phone interviews for this study were cleared by the Institutional Review Board (IRB) at John Jay College of Criminal Justice, City University of New York. A second series of In-person and phone interviews for this study were also cleared by the then centralized Institutional Review Board at The Graduate Center, City University of New York. Both processes required the primary investigator of this study as well as the Chairperson of the Examining Committee for the study to complete the Collaborative Institutional Training Initiative (CITI Program) coursework to ensure compliance with responsible and ethical human respondent policies. In both approved requests, the respective IRB panels were requested to approve Exemption 3 for public officials.

Recruitment for respondents was conducted through the professional organization of the Association of Inspectors General, headquartered at John Jay College. Individuals were approached in-person and given a brief explanation of the intent of the study and a verbal request

for participation and consent. In-person interviewees signed the consent form. Those who requested to participate in a future telephone call gave verbal consent at the beginning of the call following a complete re-reading of the consent script.

Individuals were approached directly to obtain consent for participation. The individual records contain non-identifiable values that attribute the records to each interviewee. The corresponding dataset that matches interviewees with their non-identifiable value was stored on a separate encrypted hard drive. Aside from members of the committee for this study, no other body was permitted to access the information and the study is being published without the raw data set included.

The phone interviews were not be recorded, nor was in-person communication. The primary investigator transcribed responses into a text document on an encrypted system using Apple's Filevault encryption. No respondents are identified by this study and specific organizational and investigation attributes are not connected to specific responses.

Three (3) years after the conclusion of the study, all identifiers will be permanently removed from the data and destroyed.

The structure of the interviews was to first read the interview introduction script which covered the purpose of the study: "to identify the aids and impediments to investigations of Fraud, Waste, Abuse, and Corruption" wherein the results of this study may "aid in the development of new investigative techniques and increase awareness of aids and obstructions to investigations". Those interested were then given IRB-approved waiver to be signed that they would like to participate in the study. Telephone interviewees were read the waiver and requested to provide an affirmation of their interest in participation.

The primary investigator then asked sequence of questions that sought to elicit first categorical and demographic criteria about the investigator's specific employment position. Following this, a looping sequence of questions was asked wherein interviewees recalled cases of the offense of fraud, waste, abuse, and corruption that they considered significant. At the conclusion of each offense category, a request was made for any additional cases they might consider significant for that category.

During the interview, notes were taken by hand by the primary investigator for transcription and destruction (shredding) at earliest convenience post-interview.

Survey Instrument

The survey instrument for this study was constructed to capture details about the interviewees position as an investigator, their past experience, the demographics of their investigative group, and the organization or body they were tasked to investigate and serve. Question sequence was then asked for each incident type (fraud, waste, abuse, and corruption).

Interviewees were asked the same questions in the same sequence for a critical success and failure incident. Each interviewee was able to decide whether success was first or second in order when presenting recalled cases. At the conclusion of the critical success or failure sequence, each individual was asked for another similar incident that took place when they used different Fraud, Waste, Abuse, and Corruption (FWAC) software tools.¹

The critical incident technique calls for probing questions that are framed in the context of success and failure in regard to the general aim of a position. In the context of this study, the General Aim is to investigate potential fraud, waste, abuse, and corruption (FWAC)—although one would attribute success to instances of FWAC with a successful legal outcome on behalf of the agency, an unobstructed investigation is more aligned with successful execution of the duties for that position. As such, critical success would be investigations that were not substantially hindered.

The following questions were asked, and their complimentary reasoning is provided below:

Question Series 1: Current Investigative Role

Question 1 - A: What is your current work position?

¹ FWAC software is any software used to detect, uncover, organize, evaluate, make calculations on, or otherwise investigate evidence relevant to an investigation of Fraud, Waste, Abuse, or Corruption.

This question was used to determine the specific title of the position held by the investigator and to ensure it was an investigative role.

Question 1 - B: When did you take this position?

This question was used to identify the time span of their current role, a later question captured their previous experience for the purpose of stratifying responses by investigator experience level.

Question 1 - C: How many investigators work in your investigative office?

This question identified the size of the respondent's office for further stratification of responses with their representative counterparts.

Question 1 - D: Roughly how many employees in your agency or organization is your investigative office in charge of monitoring?

This question scaled each investigator's work against the cases collected later in the survey, offering magnitude categorizing for specific cases in relation to the size of the organization they were tasked to investigate.

Question 1 - E: What is the general aim of your investigative office?

This question was used to identify the mission and goals that each investigator perceived to be their mandate. Rather than collecting this information from the respective organization's published mission statement, this question helps provide context and authority for decision-making in each incident the investigator shared.

Question 2: What were your previous work positions and when were they?

Complimentary to the question above regarding current work position, this question helped create an understanding of the experience level for each investigator. This question also helped provide matching organizational and investigative group meta information for incidents that did not occur during their current role that they shared.

Question Series 2: The Cases

Following the role and organization variable collection, the survey requested the participants to think of the last major case of fraud that they investigated. A series of questions followed. Then, if they identified significant obstacles (Question 4) during this case of fraud, the question was repeated but requested a case that occurred without significant obstacles. If, however, they identified no significant obstacles (Question 4) for that case of fraud, the question was repeated but requested a case that occurred with significant obstacles to ensure maximum coverage of case types.

Question 3: What made this incident significant?

This question was used to elicit a non-structured open-ended interpretation of what makes cases of fraud, waste, abuse, or corruption significant. This would be further coded to determine if there is a relationship between perceived success of an investigation, the outcome that occurred, and the reason for the case being significant.

Question 4 - A: Were there obstacles that prevented a thorough investigation from being conducted?

This question was used to categorize each case as Critical Success or Critical Failure. Critical Success would mean the case was able to proceed without obstacles. Critical failure would mean the case was prevented from receiving a thorough investigation due to obstacles.

Question 4 – B: What were those obstacles?

This question was an open-ended response for what particular obstacles impacted the thorough investigation of this particular case. This data would later be analyzed for simplified coding as common or uncommon obstacles that impede through investigations.

Question 5: Would you briefly describe the facts of this incident?

This question left for an open-ended general description of the incident, recorded for content analysis and potential extraction of the subcomponents 5-A through 5-D.

Question 5 – A: When did this incident occur?

This question requested temporal identification of the fraud, waste, abuse, or corruption incident. It does not force a format and was coded later to year of occurrence. The primary purpose of this question was to ensure that data collected reflected recent or at least temporally grouped information system standards used by investigators.

Question 5 – B: Who, by position title, was involved in the incident?

This question was created to identify if the position of the suspect in the incident was related to the perception of success or failure of a thorough investigation and to the outcome(s) recorded.

Question 5 – C: If applicable, what or how much was missing?

This question was designed to categorically bucket cases by their financial impact as a further predictor of success or failure of a thorough investigation, or relevant recovery outcome.

Question 5 – D: Who, by role, was involved in the investigation?

This question captured the composition of the investigatory team open-ended to result in either a specific team description or at least a count of the personnel involved.

Question 6: Did you use any software to materially assist you in performing the investigation functions for this incident of [incident type]?

This question was included with the purpose of identifying the impact of software on an investigation as an independent binary variable.

Question 6 – A: If yes:

- i. Which software did you use?

This question offered an open-ended retelling of which software was used, as specific as the respondent was ready to share or recalled.

- ii. Which specific features did you find useful in this investigation?

This question was included to identify the specific features in 6Ai that they recalled being materially useful to the investigation.

Question 6 – B: If no:

- iii. Was there a specific software feature or features that could have been useful to you in this investigation?

Question 6 – C: Were there any software-related issues that hindered your investigation, either due to:

This question was asked of each respondent, regardless of whether they stated that there were software used that materially hindered in performing the investigation. This question allows this study to model software hindrance as a binary variable in planned regressions.

- i. Software limitations? What was the workaround?

This question was asked to determine if there were software limitations and if any workarounds were employed.

- ii. Software usage difficulties? What was the workaround?

This question sought to determine if there were difficulties using software that hindered the investigation and again, the workarounds that alleviated these obstacles.

- iii. Other factors? What was the workaround?

Concluding the material software impact questions, an open-ended response was requested for whether other software related factors hindered the investigation.

Question 7: Which of the following outcomes can be attributed to this incident?

For the purpose of creating a multivariate multiple regression, this question requested whether each of the following outcomes were present in this case and/or if it was still pending outcome. Each was asked and recorded as a binary value, with the exception of “Financial Recovery” where each bucket of recovered percentage was offered and one was selected by the respondent, and the open-ended request for “Other” outcomes.

Indictment and Criminal charges are captured to provide a catch-all measure of whether charges of any kind were formally filed as the process varies by jurisdiction and either option may or may not be available—for the purposes of analysis this will be coded as any charges.

- Criminal Charges

Criminal charges are included as a component of the intended grouping of legal outcomes.

- Indictment

Indictment is included as a component of the intended grouping of legal outcomes, although similar to criminal charges, it may be the only option or an alternative option in a given jurisdiction.

- Termination

Termination is intended to be included as its own outcome in further analysis.

- Arrest

Arrest is included as a component of the intended grouping of legal outcomes.

- Conviction

Conviction is included as a component of the intended grouping of legal outcomes.

- Financial Recovery

Financial recovery is intended to be included as its own outcome in further analysis. Four options are given to the respondent.

- Full 100%
- Greater than 50%
- Less than 50%
- No Recovery

- Case still pending

Case still pending is included to explain if no other outcomes had occurred yet and for future study.

- Other

Other is intended to aid in the capture of Grounded Theory additions to the outcome analysis.

Question 8: Can you think of another significant case of [incident type] in the past similar to this one, either in your current position or a past position, where you were using different software for material support in your investigation?

This question was used to illicit additional cases as part of the Critical Incident Technique of triggering memories of semantically similar cases.

Analysis & Models

Quantitative Analysis

This study uses two series of binary logistic regressions that use each coded outcome as dependent variables. The first (1) series of regressions uses Critical Success as the independent variable, this is to answer how, if at all, having a thorough investigation can be a predictor for each outcome. The second (2) series of regressions tested the impact of software on the same dependent variable outcomes.

The binary logistic regressions were conducted with *Enter* method in series one (1) using Critical Success and Critical Failure, coded as 1 for success and 0 for failure, as an independent variable, and in series two (2) using Software Assistance, coded as 1 for software materially assisted the investigation and 0 for having no.. The dependent variables were the categorical but potentially overlapping outcomes, run individually. The significance level used for all tests was 0.05, allowing for a 5% risk that a relationship discovered was a false positive.

Assumptions

The binary logistic regressions meet the four (4) assumptions needed to fit the model. The first assumption, that the of a dichotomous dependent variable, is met by the binary coding of the various outcome dependent variables used. The second assumption, having one or more independent variables, is met by using the Critical Success or Software Assistance predictors. The third assumption, requiring independent observations with variables that are mutually exclusive and exhaustive is met by recording the values as attributes independent of collinearity in the design. The fourth assumption, requiring linearity between continuous independent variables and the logit transformation of the dependent variable, is met by using a binary value predictor. (Stoltzfus, 2011)

Series One (1) Binary Logistic Regressions for predicting impact of Critical Success on the grouped outcomes.

Dependent Variables:

VARIABLE	TYPE	DESCRIPTION
LEGAL	BINARY VALUE	Any Arrest, Indictment, Charges, or Conviction
TERMINATE	BINARY VALUE	Termination, forced resignation, forced retirement, or debarred
POLICY	BINARY VALUE	Any policy change
RECOVERY	BINARY VALUE	Any financial recovery

Independent Variables:

VARIABLE	TYPE	DESCRIPTION
CRITICAL_SUCCESS	BINARY VALUE	Was a thorough investigation able to occur

Series One (1) Binary Logistic Regressions for predicting impact of Software Assistance on the grouped outcomes.

Dependent Variables:

VARIABLE	TYPE	DESCRIPTION
LEGAL	BINARY VALUE	Any Arrest, Indictment, Charges, or Conviction
TERMINATE	BINARY VALUE	Termination, forced resignation, forced retirement, or debarred
POLICY	BINARY VALUE	Any policy change
RECOVERY	BINARY VALUE	Any financial recovery

Independent Variables:

VARIABLE	TYPE	DESCRIPTION
SOFTWARE_ASSIST	BINARY VALUE	Was any software used to materially assist you in performing the investigation functions for this incident

Qualitative Analysis

In addition to the quantitative analysis, a third (3) analysis was conducted in this study to look qualitatively at the types of obstacles observed by investigators and model the phenomenon of obstacles in Inspectors General work. These obstacles were coded down to macro categories to explain what impacts a thorough investigation from being concluded.

A fourth (4) qualitative model was created from the interview question requesting why a particular case of fraud, waste, abuse, or corruption was perceived to be significant by the investigator. These responses were coded down to larger categories that offer explanation for what types of cases that investigators find significant. Due to a substantial amount of investigator discretion (Feldman & Eichenthal, 2013) this helps explain how cases are selected and prioritized by Inspectors General.

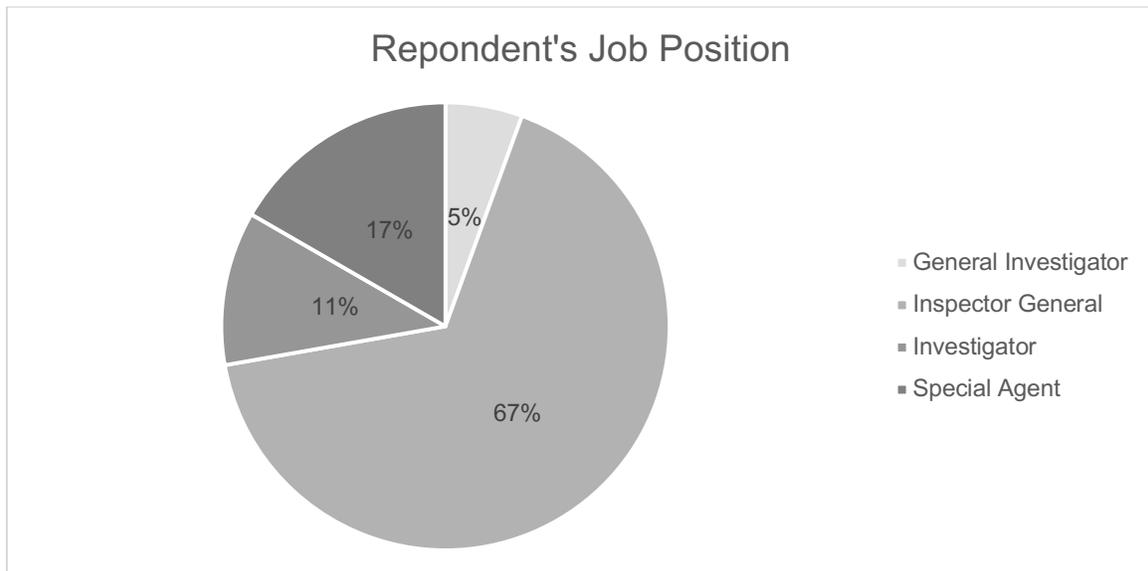
A fifth (5) analysis was conducted on the responses to describing the mission of their office as investigators. This analysis looked at word usage and provides a common frequency image of what an Inspectors General office considers their primary task and how they see their role as investigators.

Chapter 4: The Results

Data Collection Summary

This study collected cases from 19 respondents who identified themselves as either a General Investigator, Inspector General, Investigator, or Special Agent (See Table 3. Respondent employment and organizational attributes). The collection occurred during two events, one in Fall 2013 and the other in Fall 2016 via the professional organization of the Association of Inspectors General, headquartered at John Jay College.

Figure 1. Breakdown of respondent job positions.



These 19 interviews resulted in 74 cases of Fraud, Waste, Abuse, or Corruption, each with a large group of binary attributes and contextual values. The cases were broken down as: (1) Fraud: 32 out of 74 (43.24%), (2) Waste: 17 out of 74 (22.97%), (3) Abuse: 13 out of 74 (17.57%), and (4) Corruption: 12 out of 74 (16.22%). According to the respondents, it is possible for a case to be more than one of these four (4) categories, however the survey instrument categorized at the outset by asking for a case that met one of the categories. Respondents were not asked for additional categorization for each case in this study.

Figure 2. Total cases of Fraud, Waste, Abuse, and Corruption collected.

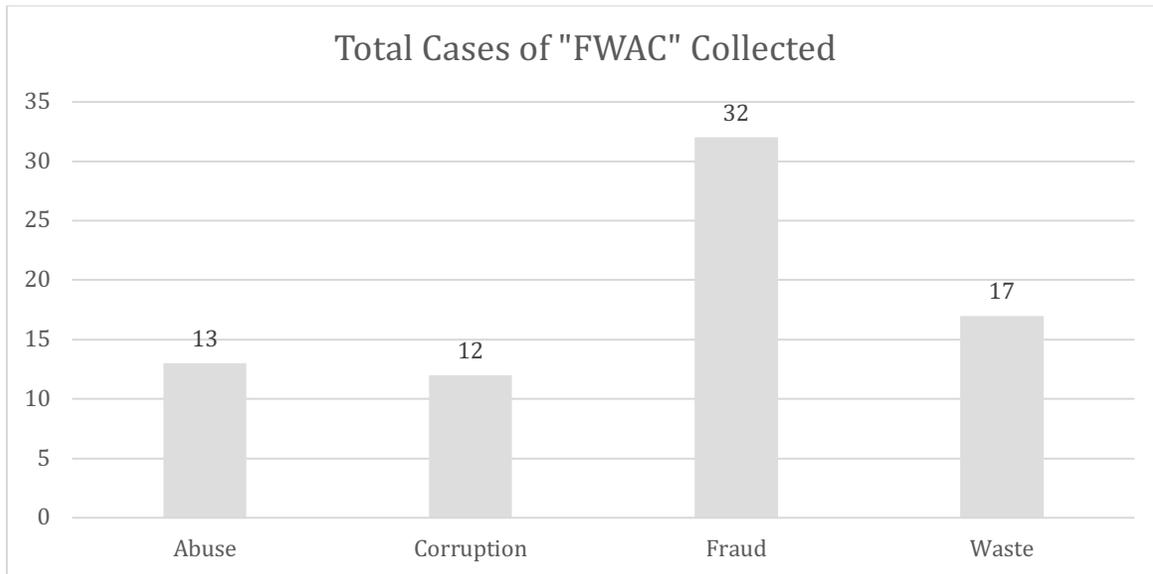


Table 1. Total respondents, cases collected by type.

METRIC	COUNT
TOTAL RESPONDENTS	19
TOTAL CASES	74
ABUSE	13
CORRUPTION	12
FRAUD	32
WASTE	17

Questions 1 and 2: Respondent Background

Respondents were asked for their background during the setup phase of the interview, providing information on their previous employment, their current position and tenure there, the size of their investigative office, and the size of the agency or organization they were tasked with investigating. The minimum tenure at their current investigative position was 1 year and the maximum was 16 years so far, with a median year in current position of 3.5. The sizes of the investigative offices ranged from 1 to 600 with a median of 11 investigative personnel. Although not all respondents provided the size of the group they were tasked with investigating, the range

was 100 to 500,000 persons, with a median population of 4,000. With the exception of 2 Attorneys and 2 whose role was unknown, 15 of the 19 respondents held an investigative, auditing, or law enforcement position prior to their current investigation role.

Table 2. Respondent employment and organizational attributes.

Position	Previous Position	Years in Current Position	Size of Investigative Office	Size of Group Investigated
General Investigator	Probation Officer	2	5	100
Inspector General	Unknown	2	350	25,000
Inspector General	Attorney	5	30	50,000
Inspector General	Inspector General	6	4	20,000
Inspector General	Investigator	2	6	-
Inspector General	Police	5	2	9,000
Inspector General	Auditor	4	13	4,000
Inspector General	Investigator	5	17	-
Inspector General	Attorney General Office	1	12	-
Inspector General	Unknown	11	13	-
Inspector General	Special Agent	16	10	7,000
Inspector General	Military	1	1	600
Inspector General	Auditor	3	9	500
Investigator	Attorney	2	4	4,000
Investigator	Military	4	10	4,800
Special Agent	Investigator	13	15	60,000
Special Agent	Investigator	1	600	500,000
Special Agent	Unknown	2	38	160,000

Questions 3: Significance of Case

Question 3 requested the reason that the fraud, waste, abuse, or corruption case was considered significant by the respondent. The data collected for question 3 was coded down to common themes based on the value of the answer and checked for compatibility with the totality of the explanation given for each case, with multiple reasons for significance attributed when applicable. To prevent coding biases and mistakes, no additional themes were applied if they were not expressly mentioned by the respondent. For example, to qualify for the Financial Amount label, the respondent needed to explicitly state that the amount was notably high or

similar language. A case that exemplified similar characteristics was not coded as Financial Amount if the respondent did not make that determination verbally.

Table 3. Matching cases by reason for significance.

REASON FOR SIGNIFICANCE	MATCHING CASES
FINANCIAL AMOUNT	17
VULNERABLE GROUP	15
MISAPPROPRIATION	12
HIGH RANKING OFFICAL	8
ABUSE OF PRIVILEGE	6
PUBLIC DISPLAY OF ABUSE	5
NUMBER INVOLVED	3
CORRUPT PUBLIC SERVANT	3
LAW ENFORCEMENT CORRUPTION	3
AGGRESSIVE ADVERSARY	2
BRIBERY	2
GOOD INVESTIGATION	2
PUBLIC SAFETY	2
CLEAR REMEDY	1
JAILTIME	1
WENT TO TRIAL	1

Further coding of the significance label to a macro level was conducted, grouping position-based significance into a new variable called *Position of Suspect* and abuse related values into a new variable called *Abuse of Power*. The remaining values were put into a similar sized category label called *Other Notability*.

Amount

The financial value of the fraud, waste, abuse, or corruption was the most common reason given by respondents for a case being significant, occurring in 17 of the 74 cases (22.97%). For the respondents that cited financial amount for case significance, all 17 cases were for large amounts or frequent disbursements.

Vulnerable Group

The category of vulnerable group was assigned to 15 out of the 74 cases (20.27%) shared by respondents. The specific vulnerable groups covered in the 15 cases were those medically disadvantaged, inmates, charities, veterans, firefighters (public servants), and children.

Other Notability

Other notability was assigned to 14 out of 74 cases (18.92%) shared by respondents, wherein the response did not meet any of the other categories mentioned. The specific reasons provided were: (1) aggressive adversaries who pursued legal and extralegal maneuvers to obstruct investigation progress, (2) cases involving bribery, (3) there being a clear remedy to the infraction investigated, (4) a particularly thorough or comprehensive investigation, (5) the number of persons involved, (6) a threat to public safety, (7) the case going to trial, and (8) someone receiving jail time as a result of the investigation and prosecution.

Position of Suspect

The position of a suspect was attributed to 14 out of 74 cases (18.92%) as a reason for significance. This is further broken down into (1) corrupt public servants that are not high ranking or law enforcement, (2) high ranking public officials, and (3) corruption by law enforcement.

Misappropriation

Misappropriation was attributed to 12 out of 74 cases (16.22%) as a reason for significance. Misappropriation cases included timesheet fraud, using government resources for private use, spending earmarked funds on non-designated expenses, fraudulent use of expense account, and contract fraud.

Abuse of Power

For 14 out of 74 cases (14.86%), the respondents cited abuse of power as a reason for significance for that case. This was broken down into abuse of privilege (6 cases) and public

display of abuse (5 cases) where the employee, official, or contractor publicly flaunted their violations or their proceeds.

Table 4. Matching cases by macro reason for significance.

CATEGORY	MATCHING CASES
AMOUNT	17
FINANCIAL AMOUNT	17
VULNERABLE GROUP	15
VULNERABLE GROUP	15
OTHER NOTABILITY	14
AGGRESSIVE ADVERSARY	2
BRIBERY	2
CLEAR REMEDY	1
GOOD INVESTIGATION	2
NUMBER INVOLVED	3
PUBLIC SAFETY	2
WENT TO TRIAL	1
JAILTIME	1
POSITION OF SUSPECT	14
CORRUPT PUBLIC SERVANT	3
HIGH RANKING OFFICAL	8
LAW ENFORCEMENT CORRUPTION	3
MISAPPROPRIATION	12
MISAPPROPRIATION	12
ABUSE OF POWER	11
ABUSE OF PRIVILEGE	6
PUBLIC DISPLAY OF ABUSE	5
GRAND TOTAL	83

Questions 4: Thorough Investigations

For the 74 cases shared by respondents, waste cases had the highest success rate with 47.06%, abuse cases perceived successful at 38.46%, fraud cases at 37.5%, and corruption cases at 25%. The average critical success rate for cases was 37.01% across all cases observed.

Table 5. Total cases, critical success or failure, and success rate by type.

CASE TYPE	CASES	SUCCESS CASES	FAILURE CASES	SUCCESS RATE
FRAUD	32	12	20	37.50%
WASTE	17	8	9	47.06%
ABUSE	13	5	8	38.46%
CORRUPTION	12	3	9	25.00%
	74	28	46	37.01%

When removing cases still pending outcome(s), the total number of non-pending cases was reduced to 51. Of those 51 cases, the average success rate went down to 33.21%, with waste cases still leading in success rate at 42.86%, abuse cases at 40.00% successful, fraud cases at 27.78%, and corruption cases at 22.22%.

Table 6. Total cases, critical success or failure, and success rate by type, for cases not pending outcome only.

CASE TYPE	CASES	SUCCESS CASES	FAILURE CASES	SUCCESS RATE
FRAUD	18	5	13	27.78%
WASTE	14	6	8	42.86%
ABUSE	10	4	6	40.00%
CORRUPTION	9	2	7	22.22%
	51	17	34	33.21%

Obstacles

Macro level obstacles have been coded to distinguish between interaction with the suspect, the quality of evidence, political pitfalls or hurdles, jurisdictional challenges, impact of the bureaucratic process, and a variety of challenges that relate to powers and capability of the investigator's office in the context of their investigation scope or qualities.

Table 7. Obstacle themes and matching case counts.

CATEGORY	COUNT
SUSPECT COOPERATION	14
EVIDENCE QUALITY	13

POLITICAL	13
JURISDICTIONAL	9
BUREACRATIC	8
LEGAL LIMITS	6
LIMITED SKILLSETS	4
SCOPE	3
UNDERSTAFFING	3

Suspect Cooperation

Out of the 74 cases included in this study, 14 listed suspect cooperation (18.9%) as an impediment to a thorough investigation. The obstacles that were categorized this way all reflect actions taken by suspects that withheld information related to the case or pushed back against the investigatory process. Suspect cooperation obstacles can be summarized as refusing to provide records including preventing the flow of information to relevant parties (5 cases) colluding with others (2 cases), leaving a position (2 cases), or retaining counsel (5 cases).

Evidence Quality

For 74 of cases surveyed, 13 listed evidence quality (15.6%) as an impediment to a thorough investigation. Evidence quality issues could be further categorized as :(1) untrustworthy evidence such as falsified records or testimony, and (2) poor records kept, either a lack of evidence or low-quality evidence.

Political

For 13 of the 74 cases, the respondents listed political issues (15.6%) as an impediment to a thorough investigation. Political issues can be further categorized as: (1) political power and ties of the suspect, and (2) organizational political pushback.

Jurisdictional

Out of the 74 cases included in this study, 9 listed jurisdictional issues (12.2%) as an impediment to a thorough investigation. Respondents cited an often-uncooperative interagency landscape for these cases, where competing agencies had different processes and role expectations.

Bureaucratic

Out of the 74 cases included in this study, 8 listed issues associated with bureaucratic systems (10.8%) as an impediment to a thorough investigation. The respondents described an array of issues specifically attributed to the legally defined bureaucratic policies and system they were working with or within. These can be grouped by whether it reflects a process being: (1) inherently flawed, or (2) done with intent or by negligence.

Legal Limits

For 6 of the 74 cases shared by respondents, legal limitations (8.1%) were listed as an impediment to a thorough investigation. The legal limitations shared were lack of independence, insufficient powers with specific interest in subpoena power, and statute of limitations.

Limited Skillsets

Limited skillsets were associated with 4 of the 74 cases (5.4%) as an impediment to a thorough investigation. The specific obstacles reported were insufficient training, dealing with new technology, lacking specific expertise on staff, and an inability to identify missing skillsets or fill those roles.

Scope

The scope of the investigation was listed as an impediment to a thorough investigation in 4 out of 74 of the cases (4.1%). The specific obstacles observed were case complexity, volume of documents and case material, and time commitment.

Understaffing

Staffing limitations were associated with 4 out of 74 cases (4.1%) as an impediment to a thorough investigation. Staffing limitations covered inadequate staffing of both the investigator's office as well as relevant aiding groups.

The breakdown for these categories has been summarized below, removing specific details about the cases investigated in lieu of the fundamental concern raised. These descriptions reflect a redux of the values for the purpose of sanitizing specific case details and giving familiar language—the classification work was done prior to the sanitization routine.

Table 8. Obstacle themes and specific obstacle breakdowns.

OBSTACLE	COUNT
SUSPECT COOPERATION	14
AGGRESSIVE ADVERSARY	1
COLLUSION, SOMEONE ALERTED SUSPECT	1
DIRECTOR UNCOOPERATIVE, STALLED, WITHHELD RECORDS, HIRED ATTORNEY	1
LACK OF COOPERATION	2
MISSING INFORMATION FROM SUSPECT	1
ORIGINAL EMPLOYEES NO LONGER WITH GOVERNMENT	1
REFUSED TO PROVIDE RECORDS, RETAINED COUNSEL	1
RESISTANCE FROM EMPLOYEES TO CHANGE	1
LONGSTANDING CORRUPTION	
SUSPECT ALREADY LEFT POSITION	1
SUSPECT RETAINED LEGAL COUNSEL	2
SUSPECTS PREVENTED INFORMATION SHARING WITH TOP	1
WITHHOLDING INFORMATION, CONTRADICTORY STATEMENTS	1
POLITICAL	13
BUSINESS HAD CLOSE TIES	1
CITY MANAGEMENT WAS APPREHENSIVE	1
EXECUTIVE DIRECTOR STALLED	1
FEAR OF RETALIATION, "OLD SCHOOL" MENTALITY	1
HINDERED BY SUSPECT'S POLITICAL CONNECTIONS	1

LACK OF HIGHER MANAGEMENT COOPERATION	1
LEADERSHIP BIAS DESPITE BRIBERY ALLEGATIONS	1
LEGAL ATTENTION AND HURDLES DUE TO GOVERNMENT MISTAKES	1
NO POPULAR OPINION TO ARREST	1
POLITICAL OBSTACLES	1
SENIOR PLAYERS UNAWARE OF IG AUTHORITY	1
TARGET WAS POLICE COMMANDER, SWORN STATUS	1
WELL CONNECTED	1
EVIDENCE QUALITY	13
1980S DATA SYSTEMS, UNABLE TO GENERATE FORMAT NEEDED	1
COMPLAINANT HAD REPUTATION FOR DISHONESTY	1
FALSIFIED DOCUMENTS	1
INADEQUATE RECORDS WITH CONTRACTOR	1
LACK OF DOCUMENTS, OLD TESTIMONY	1
LACK OF RECORD KEEPING, LACK OF DOCUMENTED PROCEDURES, POOR DOCUMENT FOR CHAIN OF CUSTODY	1
MAJORITY OF INTERVIEW WAS FALSIFIED INFORMATION	1
MISSING RECORDS	1
SMART TECH PEOPLE HID MONEY WELL.	1
SUSPECT TAMPERED WITH EVIDENCE IN DATABASE	1
UNDER REPORTING, INACCURATE REPORTING	1
VIDEO EVIDENCE FAILURE, BECAME HIS WORD VS HIS WORD	1
JURISDICTIONAL	9
COMPETING AUDITING AGENCIES	1
DEALING WITH OTHER STATE AGENCIES	1
INTERAGENCY RELATIONSHIP/ROLES	1
INTERAGENCY DIFFERENCES	1
INTERAGENCY DISPUTE ABOUT OWNING PROCESS, EVIDENCE, RELEASE	1
JURISDICTIONAL ISSUES, DIFFERING SOFTWARE NEEDED TO FIND TRAVEL MONEY	1
PARALLEL FEDERAL INVESTIGATION	1
SEVERAL AGENCIES INVOLVED	1
BUREACRATIC	8
AGENCY SHOULD HAVE DISCOVERED IT	1
CHALLENGE OF WORKING WITH POLICE	1
CHALLENGING JURISDICTION TO NAVIGATE	1
DELAY IN SUBPOENA RESPONSES	1
INADEQUATE PROSECUTION	1
MANAGEMENT WANTED INFO BEFORE INVESTIGATION COMPLETE	1
PUBLIC OFFICIALS WROTE LAWS AND KNEW WAY AROUND THEM	1
SUSPECT COULD REVIEW ALL TESTIMONY	1
LEGAL LIMITS	6

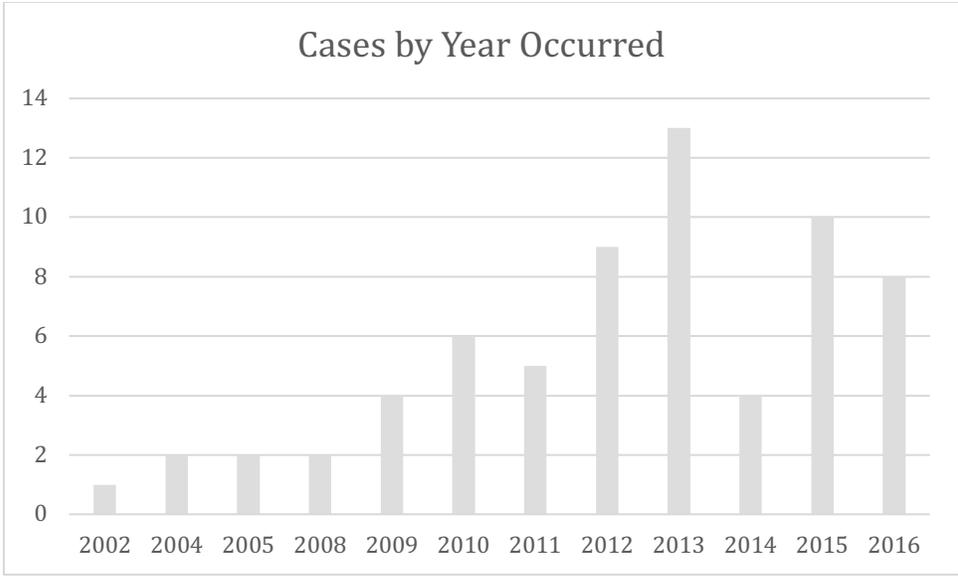
INSUFFICIENT SUBPOENA POWER	1
LACK OF INDEPENDENCE	1
LIMITED POWER	1
NEEDED COURT ORDER TO GET CORRECT SUBPOENA	1
NO SUBPOENA POWER, SUSPECTS RETAINED COUNSEL, REFUSED TESTIMONY	1
STATUTE OF LIMITATIONS	1
LIMITED SKILLSETS	4
INSUFFICIENT STAFF TRAINING BEFORE ON-THE-JOB	1
LACK OF STAFF EXPERTISE	1
NEW TECHNOLOGY	1
NOT ENOUGH ABILITY TO ASSES OR RESOLVE	1
SCOPE	3
COMPLEX, LOTS OF DOCUMENTS	1
TIME AND VOLUME OF CASE MATERIAL	2
UNDERSTAFFING	3
INSUFFICIENT RESOURCES	2
NOT ENOUGH MANPOWER	1

Question 5: Case Specifics

Case specifics were largely collected as a catch-all for potential details that may not have been able to be extracted using the specific questions above or below in the survey. Case descriptions were free-flow narratives and were used as a guiding aid for clarifying specific coding routines in Question 4.

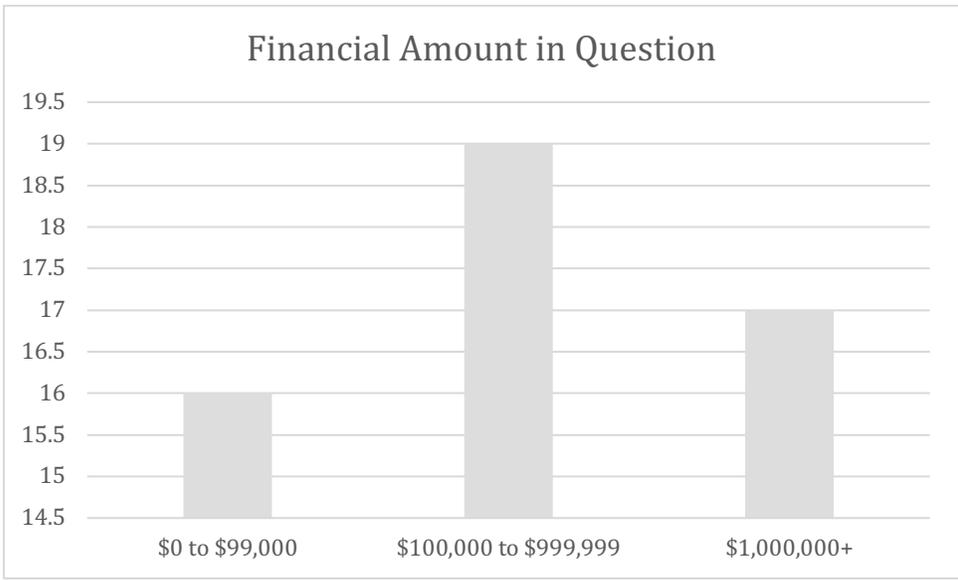
Question 5 also requested 4 subcomponents for each case to identify when the case occurred and details about the scope of the financial component. For coding, case year used the median when given a range. Most cases in this study occurred between 2009 and 2016. The average number of cases collected per year were 5.5 with a median of 4.5.

Figure 3. Fraud, waste, abuse, and corruption cases investigated by year.



Financial component, or potential financial loss as a result of the fraud, waste, abuse, or corruption was coded into buckets of less than \$100,000, between \$100,000 and \$999,999, and \$1,000,000 or greater. The majority of cases stayed within the range of \$50,000 to \$2,000,000.

Figure 4. Fraud, waste, abuse, and corruption cases by financial amount missing or in question.



Question 6: Software role

While Question 6 was designed to capture details about the material role that software played in conducting thorough investigations, the leading question of whether software material assisted or not was the only consistently answered question amongst respondents. Additional supporting details were also collected but only 3 of the 18 respondents provided specific details about the features, limits, workarounds, difficulties, or other relevant details about the specific software.

As per Question 6Ai, respondents were asked which specific software they had used to materially support their investigations. Of the 65 cases that provided details on the software used, 48 (73.8%) of cases utilized spreadsheet software, 16 (24.6%) of cases utilized database software, generally proprietary to the investigated group, such as Motor vehicle databases and personnel systems, or Lexis Nexis, 8 (12.3%) used case management software, 15 (23%) used forensics software for data analysis, and 3 (0.5%) specified case-specific software opportunities such as video surveillance or office networking firewall logs.

Table 9. Types of software used for each case.

TYPE OF SOFTWARE	MATCHING CASES
SPREADSHEETS	48
DATABASE	16
CASE MANAGEMENT	8
FORENSICS	15
OTHER	3

Question 7: Outcomes

Of the cases recorded, 51 out of 74 (68.92%) were still pending outcome(s) according to the respondents. For the cases marked no longer pending outcome(s), 21 out of 51 (41.18%) had charges filed for at least one suspect, 14 out of 51 (27.45%) had at least one indictment, 21 out of 51 (41.18%) had at least one termination, 19 out of 51 (37.25%) had at least one arrest, and 17 out of 51 (33.33%) resulted in at least one conviction. This survey did not request specific counts on the total charges, indictments, terminations, arrests, or convictions as a direct result with this case.

Table 10. Case outcomes by case type with no pending additional outcomes.

	TOTAL	CHARGE	INDICTMENT	TERMINATION	ARREST	CONVICTION
ABUSE	10	3	4	3	4	3
CORRUPTION	9	5	1	3	4	3
FRAUD	18	13	9	10	11	11
WASTE	14	0	0	5	0	0
TOTAL	51	21	14	21	19	17

For the remaining 23 out of 74 (31.08%) of cases still pending outcome(s) according to the respondents, there were some outcomes recorded so far. Of these cases, 21 out of 51 (41.18%) had charges filed for at least one suspect, 14 out of 51 (27.45%) had at least one indictment, 21 out of 51 (41.18%) had at least one termination, 19 out of 51 (37.25%) had at least one arrest, and 17 out of 51 (33.33%) resulted in at least one conviction. This survey did not request specific counts on the total charges, indictments, terminations, arrests, or convictions as a direct result of each case.

Table 11. Case outcomes by case type with no pending additional outcomes as percentage of total outcomes for each outcome type.

	TOTAL	CHARGE	INDICTMENT	TERMINATION	ARREST	CONVICTION
ABUSE	19.61%	14.29%	28.57%	14.29%	21.05%	17.65%
CORRUPTION	17.65%	23.81%	7.14%	14.29%	21.05%	17.65%
FRAUD	35.29%	61.90%	64.29%	47.62%	57.89%	64.71%
WASTE	27.45%	0.00%	0.00%	23.81%	0.00%	0.00%
TOTAL	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Fraud cases totaled 18 out of 51 (35.29%) of non-pending cases and resulted in the highest outcome rate in each recorded outcome type despite encompassing just over 35% of these cases. Specifically, fraud covered 13 out of 21 (61.90%) cases that resulted in charges filed, 9 out of 14 (64.29%) of cases with an indictment, 10 out of 21 (47.62%) of cases with at least one termination, 11 out of 19 (57.89%) of cases with at least one arrest, and 11 out of 17 (64.71%) cases that resulted in a conviction.

Waste cases totaled 14 out of 51 (27.45%) of non-pending cases and resulted in the least likelihood for any of the recorded outcome types. Specifically, waste covered 0 out of 21 (0%) cases that resulted in charges filed, 0 out of 14 (0%) of cases with an indictment, 5 out of 21 (23.81%) of cases with at least one termination, 0 out of 19 (0%) of cases with at least one arrest, and 0 out of 17 (0%) cases that resulted in a conviction.

Abuse cases totaled 10 out of 51 (19.61%) of non-pending cases. Specifically, abuse covered 3 out of 21 (14.29%) cases that resulted in charges filed, 4 out of 14 (28.57%) of cases with an indictment, 3 out of 21 (14.29%) of cases with at least one termination, 4 out of 19 (21.05%) of cases with at least one arrest, and 3 out of 17 (17.65%) cases that resulted in a conviction.

Corruption cases totaled 9 out of 51 (35.29%) of non-pending cases. Specifically, corruption covered 5 out of 21 (23.81%) cases that resulted in charges filed, 1 out of 14 (7.14%) of cases with an indictment, 3 out of 21 (14.29%) of cases with at least one termination, 4 out of 19 (21.05%) of cases with at least one arrest, and 3 out of 17 (17.65%) cases that resulted in a conviction.

Table 12. Case outcomes by case type with pending additional outcomes.

	TOTAL	CHARGE	INDICTMENT	TERMINATION	ARREST	CONVICTION
ABUSE	3	1	1	0	0	0
CORRUPTION	3	2	1	1	1	2
FRAUD	14	8	4	7	6	3
WASTE	3	0	0	0	0	0
TOTAL	23	11	6	8	7	5

The survey also requested an additional outcome, if any, that the respondents attributed to each case. This produced a series of responses that spoke to specific outcomes related to the cases, but two common themes emerged: (1) policy or internal control change as a result of the case, and (2) Other outcome similar to termination, either: debarred for lawyers, contract terminated for contractors (including “Vendex” delisting), and forced resignations or retirements.

Chapter 5: Analysis & Findings

Summary

This findings section covers the (1) Outcome analysis using a series of binary logistic regressions against grouped common outcomes from fraud, waste, abuse, and corruption cases, (2) the examination of the role of Inspectors General through a qualitative analysis of their self-described office mission statements as well as a model of what makes cases significant, (3) a model of the obstacles faced by investigators while attempting to conduct a thorough investigation, and (4) a binary logistic regression examining the same common case outcomes against the predictor of material support by software.

Outcomes

1. What outcomes are correlated with a successfully thorough investigation?

After including and coding for the additional outcome variables that were shared by the respondents, the following primary categories were created as dependent variables:

1. Legal outcome (Arrest, Indictment, Charges, or Conviction)
2. Termination (Termination, forced resignation/retirement, or debarred)
3. Policy (Policy/Internal control changes)
4. Recovery (Any financial recovery)

The resulting binary logistic regression model, which has expanded the definitions of Terminations and added the outcome of Policy, is detailed as:

Dependent Variables:

VARIABLE	TYPE	DESCRIPTION
LEGAL	BINARY VALUE	Any Arrest, Indictment, Charges, or Conviction
TERMINATE	BINARY VALUE	Termination, contractor barred, forced resignation, forced retirement, or debarred
POLICY	BINARY VALUE	Policy or internal control changes

RECOVERY

BINARY VALUE

Any financial recovery

Independent Variables:

VARIABLE	TYPE	DESCRIPTION
CRITICAL_SUCCESS	BINARY VALUE	Was a thorough investigation able to occur

Legal Outcome

This binary logistic regression analysis tests the likelihood of a legal outcome, such as arrest, indictment, charges, or conviction based on whether the investigation was able to be conducted thoroughly. All 74 cases had a value and were able to be included in the analysis. For complete statistical test output, which includes: (1) case processing summary which details which cases could be included in the analysis, (2) variable encoding detected, (3) block 0 (baseline) of the Enter method logistic regression, (4) block 1 test of whether case being conducted thoroughly impacted dependent variable, and (5) the model summary, fit, and final equation, see appendix (“OUTPUT 1. Predicting legal outcome of case based on ability to conduct thorough investigation.”).

When running this regression model, whether a case was able to be conducted thoroughly did not have a statistically significant impact on likelihood of a legal outcome ($p=0.538$, $p>0.05$) as the p-value did not fall below the significance level of 0.05.

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	100.251 ^a	.005	.007

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Table^a

	Observed	Predicted		Percentage Correct
		OUTCOME_LEGAL 0	OUTCOME_LEGAL 1	
Step 1	OUTCOME_LEGAL 0	0	31	.0

	1	0	43	100.0
Overall Percentage				58.1

a. The cut value is .500

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a CRITICAL_SUCC ESS	-.299	.485	.380	1	.538	.742
Constant	.442	.302	2.139	1	.144	1.556

a. Variable(s) entered on step 1: CRITICAL_SUCCESS.

Policy Outcome

This binary logistic regression analysis tests the likelihood of a policy outcome, such as a policy or internal control change based on whether the investigation was able to be conducted thoroughly. All 74 cases had a value and were able to be included in the analysis. For complete statistical test output, which includes: (1) case processing summary which details which cases could be included in the analysis, (2) variable encoding detected, (3) block 0 (baseline) of the Enter method logistic regression, (4) block 1 test (“OUTPUT 2. Predicting policy outcome of case based on ability to conduct thorough investigation.”).

When running this regression model, whether a case was able to be conducted thoroughly did not have a statistically significant impact on likelihood of a legal outcome ($p=0.958$, $p>0.05$) as the p-value did not fall below the significance level of 0.05.

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	101.228 ^a	.000	.000

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Table^a

	Observed		Predicted		Percentage Correct
			OUTCOME_POLICY 0	1	
Step 1	OUTCOME_POLICY	0	42	0	100.0
		1	32	0	.0
Overall Percentage					56.8

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	CRITICAL_SUCC	-.025	.484	.003	1	.958	.975
	ESS						
	Constant	-.262	.297	.778	1	.378	.769

a. Variable(s) entered on step 1: CRITICAL_SUCCESS.

Recovery Outcome

This binary logistic regression analysis tests the likelihood of a recovery outcome, which was any financial recovery, based on whether the investigation was able to be conducted thoroughly. All 74 cases had a value and were able to be included in the analysis. For complete statistical test output, which includes: (1) case processing summary which details which cases could be included in the analysis, (2) variable encoding detected, (3) block 0 (baseline) of the Enter method logistic regression, (4) block 1 test ("OUTPUT 3. Predicting recovery outcome of case based on ability to conduct thorough investigation.").

When running this regression model, whether a case was able to be conducted thoroughly did not have a statistically significant impact on likelihood of a legal outcome ($p=0.914$, $p>0.05$) as the p-value did not fall below the significance level of 0.05.

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	97.101 ^a	.000	.000

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Table^a

Observed		Predicted		Percentage Correct
		OUTCOME_RECOVER 0	OUTCOME_RECOVER 1	
Step 1	OUTCOME_RECOVER 0	47	0	100.0
	OUTCOME_RECOVER 1	27	0	.0
Overall Percentage				63.5

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	CRITICAL_SUCC	-.054	.499	.012	1	.914	.948
	ESS						
Constant		-.534	.305	3.057	1	.080	.586

a. Variable(s) entered on step 1: CRITICAL_SUCCESS.

Termination Outcome

This binary logistic regression analysis tests the likelihood of a termination outcome, which was a termination, a contractor being barred, a forced resignation, forced retirement, or debarment, based on whether the investigation was able to be conducted thoroughly. All 74 cases had a value and were able to be included in the analysis. For complete statistical test output, which includes: (1) case processing summary which details which cases could be included in the analysis, (2) variable encoding detected, (3) block 0 (baseline) of the Enter method logistic regression, (4) block 1 test (“OUTPUT 4. Predicting termination outcome of case based on ability to conduct thorough investigation.”).

When running this regression model, whether a case was able to be conducted thoroughly did not have a statistically significant impact on likelihood of a legal outcome (p=0.856, p>0.05) as the p-value did not fall below the significance level of 0.05.

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	102.499 ^a	.000	.001

a. Estimation terminated at iteration number 2 because parameter estimates changed by less than .001.

Classification Table^a

	Observed	Predicted		Percentage Correct
		OUTCOME_TERMINAT E	OUTCOME_TERMINAT E	
Step 1	OUTCOME_TERMINAT E	0	1	.0
		0	36	100.0
Overall Percentage				51.4

a. The cut value is .500

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a CRITICAL_SUCC ESS	-.087	.480	.033	1	.856	.917
Constant	.087	.295	.087	1	.768	1.091

a. Variable(s) entered on step 1: CRITICAL_SUCCESS.

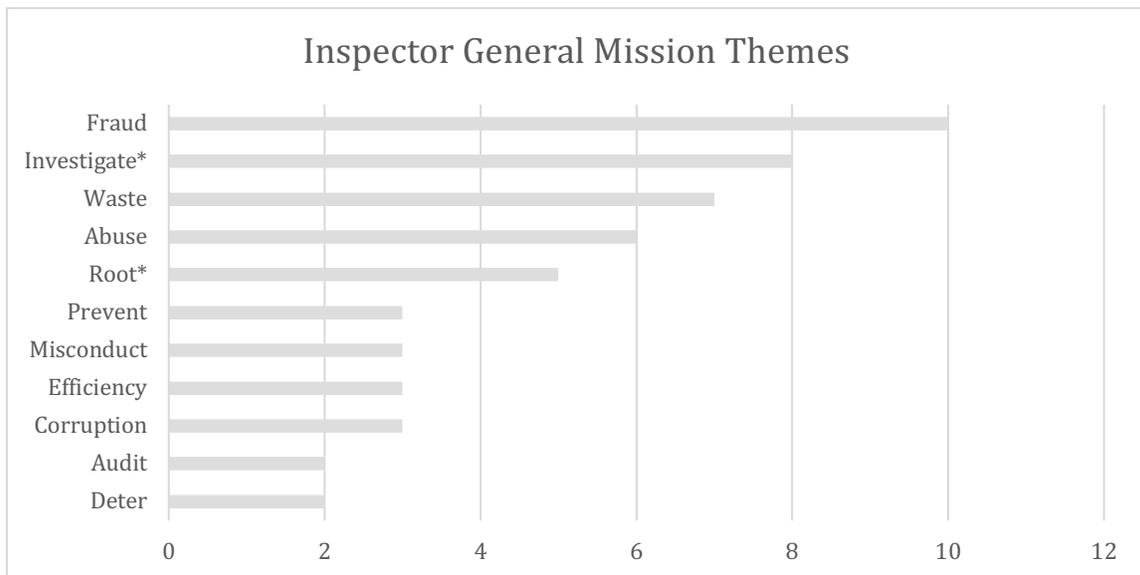
When running the above regressions, no statistical significance was found using CRITICAL_SUCCESS to predict any of the outcomes tested. Essentially, the presence of a thorough investigation not was tied to a statistical increase in the number of cases that ended with any specific outcome group tested and this analysis cannot reject the null hypothesis. This analysis found no correlation between the outcomes reported by respondents and whether the investigation was able to be completed thoroughly.

Inspector General Role

2. What do Inspectors General see as their role?

Of the 18 investigators that were surveyed, 13 provided the mission of their office, while 5 requested that their mission response be copied from their office website to ensure they did not provide an incomplete, inaccurate, or rushed explanation. Using the 13 responses, a content analysis word matrix was created to determine frequency of word and theme use. Fields annotated with an asterisk (*) reflect cases where synonyms were used. For investigate, the synonyms were: find, uncover, and root out. The definition for root from Merriam-Webster (2019) is “to find and remove (something or someone)” with the first component being find. Root was used again later for the second component of “and remove”. The synonyms or related phrasing used for root out, as an action verb, were: “bring efficiency”, “with an eye for prosecution or indictment”, and pursue.

Figure 5. Thematic analysis of investigator mission.



At the outset of this study, one of the goals was to establish a common definition for the mission of Inspector General's see for their role. Citing the above analysis, fraud, waste, abuse, misconduct, [in]efficiency, and corruption are the common subjects of investigator's mission. Investigate, root [out], prevent, audit, and deter are the common actions that these investigator's shared. While the mission and scope will vary by the form and function of each investigator's office, the goal of *Investigating and rooting out fraud, waste, and abuse* is the most common definition. A more inclusive goal may be *Prevent, investigate, and root out fraud, waste, abuse, misconduct, and corruption to preserve or restore efficiency*.

Case Significance

3. What makes cases significant to Inspector General?

The prevailing themes for the respondent explanation of what made a particular case significant were financial scale of the case, the prestige or influence of the individual or individuals being investigated, and the perceived moral audacity of the particular offenses relating to their victim demographics. This study also reveals an underlying connection between the investigator's tasked mission as an Inspector General and the types of cases that are prioritized and resourced, demonstrating how they use their investigational discretion to advance that mission.

This study also offers an explanation for the perceived successful outcomes of investigations as retributive justice for the purpose of reducing Fraud, Waste, Abuse, and Corruption. The common explanation by respondents that the resulting outcomes, despite not achieving all possible positive outcomes relating to criminal exposure, asset recovery, or public remedy, were still successes hinged on the underlying common goal of retribution for the sake of social and governmental order. This is also seen as promoting both general and specific deterrence (Stafford & Warr, 1993).

Obstacles

4. What impedes a thorough investigation?

The resulting model from coding the obstacles faced by investigators when attempting to conduct a thorough investigation can be explained by the summarized descriptions of each obstacle. Primary obstacles to thorough investigations were suspect cooperation, political, evidence quality, jurisdictional, bureaucratic, legal limits, limited skillsets, scope, and understaffing. Further breakdown provides a potential reflexive survey to catalog occurrences of these obstacles within and around investigations.

Software

5. Is software critical to the successful completion of investigations?

Using the same outcome variables that were coded during the Outcome section, the following primary categories were created as dependent variables:

1. Legal outcome (Arrest, Indictment, Charges, or Conviction)
2. Termination (Termination, forced resignation/retirement, or debarred)
3. Policy (Policy/Internal control changes)
4. Recovery (Any financial recovery)

Dependent Variables:

VARIABLE	TYPE	DESCRIPTION
LEGAL	BINARY VALUE	Any Arrest, Indictment, Charges, or Conviction
TERMINATE	BINARY VALUE	Termination, forced resignation, forced retirement, or debarred
POLICY	BINARY VALUE	Policy or internal control changes
RECOVERY	BINARY VALUE	Any financial recovery

Independent Variables:

VARIABLE	TYPE	DESCRIPTION
SOFTWARE_ASSIST	BINARY VALUE	Was any software used to materially assist you in performing the investigation functions for this incident

Legal Outcome

This binary logistic regression analysis tests the likelihood of a legal outcome, such as arrest, indictment, charges, or conviction based on whether software was used to materially assist the investigation. All 74 cases had a value and were able to be included in the analysis. For complete statistical test output, which includes: (1) case processing summary which details which cases could be included in the analysis, (2) variable encoding detected, (3) block 0 (baseline) of the Enter method logistic regression, (4) block 1 test (“OUTPUT 5. Predicting legal outcome of case based on material use of software to aid investigation.”).

When running this regression model, whether a case involved material assistance by software did have a statistically significant impact on likelihood of a legal outcome ($p=0.035$, ≤ 0.05).

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	95.583 ^a	.066	.089

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Classification Table^a

Observed	OUTCOME_LEGAL	Predicted		Percentage Correct
		0	1	
Step 1	0	8	23	25.8
	1	3	40	93.0
Overall Percentage				64.9

a. The cut value is .500

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a SOFTWARE_AS SIST	1.534	.726	4.468	1	.035	4.638
Constant	-.981	.677	2.099	1	.147	.375

a. Variable(s) entered on step 1: SOFTWARE_ASSIST.

Explanation

The introduction of SOFTWARE_ASSIST as an independent variable produced a significant impact ($p=0.035$) on the dependent variable. Stated otherwise, the use of software during an investigation had a positive material impact on a LEGAL outcome occurring, such as arrest, criminal charges, indictments, or convictions. The Odds Ratio $Exp(B)$ of 4.638 demonstrates a high likelihood of 4.638 to 1 that the use of software during an investigation will result in a legal outcome. Overall, the model was able to predict 64.9% of cases resulting in a legal outcome based on the usage of software to materially assist the investigation.

The same analysis is conducted below for each of the other measured outcomes but did not produce statistically significant results.

Policy Outcome

This binary logistic regression analysis tests the likelihood of a policy outcome, such as a policy or internal control change based on whether software was used to materially assist the investigation. All 74 cases had a value and were able to be included in the analysis. For complete statistical test output, which includes: (1) case processing summary which details which cases could be included in the analysis, (2) variable encoding detected, (3) block 0 (baseline) of the Enter method logistic regression, (4) block 1 test ("OUTPUT 6. Predicting policy outcome of case based on material use of software to aid investigation.").

When running this regression model, whether a case involved material assistance by software did not have a statistically significant impact on likelihood of a policy outcome ($p=0.873$, $p>0.05$) as the p-value did not fall below the significance level of 0.05.

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	101.205 ^a	.000	.000

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Table^a

Observed		Predicted		Percentage Correct
		OUTCOME_POLICY 0	OUTCOME_POLICY 1	
Step 1	OUTCOME_POLICY 0	42	0	100.0
	OUTCOME_POLICY 1	32	0	.0
Overall Percentage				56.8

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	SOFTWARE_AS SIST	-.105	.657	.026	1	.873	.900
	Constant	-.182	.606	.091	1	.763	.833

a. Variable(s) entered on step 1: SOFTWARE_ASSIST.

Recovery Outcome

This binary logistic regression analysis tests the likelihood of a recovery outcome, which was any financial recovery, based on whether software was used to materially assist the investigation. All 74 cases had a value and were able to be included in the analysis. For complete statistical test output, which includes: (1) case processing summary which details which cases could be included in the analysis, (2) variable encoding detected, (3) block 0 (baseline) of the Enter method logistic regression, (4) block 1 test (“OUTPUT 7. Predicting recovery outcome of case based on material use of software to aid investigation.”).

When running this regression model, whether a case involved material assistance by software did not have a statistically significant impact on likelihood of a recovery outcome ($p=0.187$, $p>0.05$) as the p -value did not fall below the significance level of 0.05.

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	95.066 ^a	.027	.037

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Classification Table^a

	Observed	Predicted		Percentage Correct
		OUTCOME_RECOVER 0	OUTCOME_RECOVER 1	
Step 1	OUTCOME_RECOVER 0	47	0	100.0
	OUTCOME_RECOVER 1	27	0	.0
	Overall Percentage			63.5

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	SOFTWARE_AS SIST	1.085	.823	1.739	1	.187	2.961
	Constant	-1.504	.782	3.702	1	.054	.222

a. Variable(s) entered on step 1: SOFTWARE_ASSIST.

Termination Outcome

This binary logistic regression analysis tests the likelihood of a termination outcome, which was a termination, a contractor being barred, a forced resignation, forced retirement, or debarment, based on whether software was used to materially assist the investigation. All 74 cases had a value and were able to be included in the analysis. For complete statistical test output, which includes: (1) case processing summary which details which cases could be included in the analysis, (2) variable encoding detected, (3) block 0 (baseline) of the Enter method logistic regression, (4) block 1 test ("OUTPUT 8. Predicting termination outcome of case based on material use of software to aid investigation.").

When running this regression model, whether a case involved material assistance by software did not have a statistically significant impact on likelihood of a policy outcome ($p=0.288$, $p>0.05$) as the p-value did not fall below the significance level of 0.05.

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	101.360 ^a	.016	.021

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Table^a

Observed		Predicted		Percentage Correct
		OUTCOME_TERMINAT E 0	OUTCOME_TERMINAT E 1	
Step 1	OUTCOME_TERMINAT E 0	7	29	19.4
	OUTCOME_TERMINAT E 1	4	34	89.5
Overall Percentage				55.4

a. The cut value is .500

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a SOFTWARE_ASSIST	.719	.676	1.131	1	.288	2.052
Constant	-.560	.627	.797	1	.372	.571

a. Variable(s) entered on step 1: SOFTWARE_ASSIST.

When running the above regressions, statistical significance was found using SOFTWARE_ASSIST to predict a legal outcome. Essentially, having software materially assist an investigation was tied to a statistical increase in the number of cases that ended with a legal outcome of arrest, charges, indictment, or conviction. This analysis can accept the alternative

hypothesis for legal outcomes. The tests for policy, recovery, and termination did not produce statistically significant results and were not able to be predicted by software use.

Chapter 6: Implications, Limitations, & Conclusion

Research Questions

This study sought to obtain answers to five (5) research questions surrounding investigators of Fraud, Waste, Abuse, and Corruption. The data to answer these questions was collected through a survey, coded for generalizability, and finally analyzed in Chapter 5 for statistical significance and common themes. Presented below is a discussion of each answer discovered in the analysis section of this study.

1. What outcomes are correlated with a successfully thorough investigation?

This study sought to understand what outcomes are contingent with cases identified as successfully thorough by Inspectors General. The study included the outcomes of Legal (Arrest, Criminal Charges, Indictment, or Conviction), Financial Recovery (whether any of the survey instrument scale values were recovered), Policy change of any kind, and Termination (if the case resulted in terminations).

Through the use of four regression analyses, this study measured the impact of having thorough investigations on achieving one of the four categories of outcomes. This study did not identify a statistically significant relationship between an investigation being considered thorough by the investigator and the likelihood that one of the outcomes above would be achieved. In other words, this study identified that whether an investigation is seen as thorough does not impact the likelihood of a case resulting in a legal outcome, financial recovery, policy change, or termination.

2. What do Inspectors General see as their role?

This study requested that respondents share the general aim of their investigative office as a means for gathering a common definition for Inspectors General mission for their role. The survey responses were coded to allow grouping of similar words and a frequency analysis was performed on the resulting data set. The study identified the common shared-term definition for

Inspectors General role as *Investigating and rooting out fraud, waste, and abuse*. The study also identified a more inclusive role as *Prevent, investigate, and root out fraud, waste, abuse, misconduct, and corruption to preserve or restore efficiency*.

3. What makes cases significant to Inspectors General?

This study asked respondents what made the cases that they shared significant. The most common answers were financial scale of the case, the prestige or influence of the individual or individuals being investigated, and the perceived moral audacity of the particular offenses relating to their victim demographics. This study also highlights the opportunity for investigators to demonstrate preference and discretion by which cases are prioritized and resourced.

4. What impedes a thorough investigation?

With each investigation that the respondents recalled, this study requested details of what, if any, obstacles occurred during the course of the investigation that prevented a thorough investigation from being conducted. Primary obstacles to thorough investigations were suspect cooperation, political, evidence quality, jurisdictional, bureaucratic, legal limits, limited skillsets, scope, and understaffing.

5. Is software material to the successful completion of investigations?

The survey requested specific information about the material use of software by investigators during each investigation. Through the use of four regression analyses, this study measured the impact of having material assistance from software on achieving one of the four categories of outcomes. This study identified a statistically significant relationship between the material use of software to assist an investigation and the likelihood that the case would result in a legal outcome of arrest, charges, indictment, or conviction. Having software assistance did not impact the likelihood of a case resulting in a financial recovery, policy change, or termination. In other words, this study identified that the material use of software in investigations was tied to a higher likelihood of obtaining a legal outcome for a case.

Implications

Financial

The investigators responding to this survey all spoke to financial resource deficiency for obtaining additional investigative tools in at least one of the cases that the respondent shared that they considered a significant case. Tasked with identifying cases of Fraud, Waste, Abuse, and Corruption, this challenges the efficacy of their position by materially diminishing their capabilities. It is unclear what additional outcomes could have been obtained by this added financial support and this study did not request classification of those subjective possible outcomes.

Personnel

As identified in the Harris (2012) study, access to the necessary personnel or the ability to hire the appropriate personnel was a limitation expressed by the respondents of this study. In particular, this study further diagnoses this limitation as insufficient staff training before on-the-job training necessity, a lack of staff expertise, a lack of understanding of new technology, and an inability to assess or resolve these deficiencies.

Software

The survey question series regarding use of computer software to aid in the investigative process was intended to illicit a collection of best practices and essential tools for this field. The results demonstrate minimal use of specialized software by investigative personnel, reflecting from the overwhelming lack of resources in the form of financial support and staffing to obtain and properly utilize these applications. The use of highly accessible spreadsheet tools and specifically sorting and filtering functionality was common in all fraud cases analyzed by this survey—namely *Microsoft Excel* was the spreadsheet tool used by all investigators covered by this study.

Other notable software mentioned included a variety of content analysis tools and suites, specific capabilities of on-site video surveillance review, and advanced firewall filtering features and their related log analysis tools.

When checking against possible outcomes, the usage of software was found to be a statistically significant predictor of having a legal outcome of arrest, criminal charges, indictment, or conviction. This study did not find a statistically significant relationship between software assistance and the other outcomes checked: Policy and internal control changes, Terminations and similar in effect outcomes, or financial recovery of any amount.

Limitations

The known limitations by the author of this study can be categorized as 1) survey shortcomings that were discovered during coding and analysis and, 2) not including specific questions regarding the non-software related workarounds to investigatory obstacles. While this study had the Grounded Theory improvement option it was not practical to employ between the fast-paced data collection routine with back to back interviews at conferences. Future study would warrant test interviews to aid in the development of the survey instrument prior to the majority of the data collection interviews.

The survey instrument shortcomings can be enumerated as:

1. Too many predictor variables requiring too many cases to achieve statistical significance during the analysis.
2. Missed opportunity to scale outcomes as a potential dependent variable, allowing for a multiple linear regression analysis.
3. Too many binary variables over ratio level variables that skew standard error.

Regarding the missed opportunity to answer additional questions, this study did not include an explicit request for workarounds with the exception of discussing software related workarounds. While respondents were given open-ended questions and provided meaningful narrative of the workarounds employed, being able to include and code non-software

workarounds into the data analysis model would have allowed for broader scope of the applicability of the results.

Future Research

On the qualitative side, while this study was able to capture thematic hindrances to thorough investigations and provide potential criteria on mission influence and case selection, further study can expand these two research avenues to answer additional phenomenological questions. In particular, what are workarounds that are used by Inspectors General in each of these obstacle cases? Reflexively, how do these understood obstacles rank and influence the course of work in Inspectors General investigations? What cases do investigatory discretion potentially diminish action on?

From the quantitative side, this study analyzed material software impact on case outcome finding a positive relationship between use of software and producing Legal outcomes. This study also looked at the relationship between whether a case was characterized as thoroughly investigated and what expected outcomes might be achieved—though there did not appear to be any significant relationship between these variables. Further quantitative study could build a larger variable set of predictors for outcomes, which would require significantly more cases, but provide a more definitive internal validity measure.

Conclusions

Inspectors General serve a critical role in government institutions, protecting against mismanagement through formalized evaluation and ongoing compliance monitoring. Previous studies have determined distinct limitations on power and authority, citing political pressure internal and external to government. This study further evaluates those obstacles and expands to include specific limitations experienced by Inspectors General during the course of producing thorough investigations.

At the outset of this study, the goal was to further understand the aids and impediments to thorough investigations for Inspectors General. The analysis sought to characterize and diagnose successful case outcomes while identifying whether there had been significant

obstructions to a thorough investigation. A quantitative analysis revealed no correlation between whether it was a thorough investigation and the achieved outcomes.

A second question from this study, what is the essential mission that Inspectors General see themselves tasked with was answered with a theme analysis. A generalizable goal of: *Investigating and rooting out fraud, waste, and abuse*, and a more inclusive: *Prevent, investigate, and root out fraud, waste, abuse, misconduct, and corruption to preserve or restore efficiency* were the preferred redux of their perceived roles.

Third, this study looked at whether software had a material impact on potential outcomes for cases. Through a binomial logistic regression, multiple models were run to determine if software support present impacted the dependent variables for outcome. Outcomes were organized into Legal, Termination, Policy, and Recovery. Software impact on generating a legal outcome (arrest, indictment, or conviction) was found to be statistically significant.

Fourth, this study sought to identify what makes cases significant in the eyes of Inspectors General, who are awarded a significant amount of discretion over which cases to prioritize. Participants in the study diagnosed case significance as primarily egregious cases that betrayed a public trust or impacted a vulnerable group.

The fifth question asked by this study, diagnosing which obstacles prevent thorough investigations from being concluded, produced *suspect cooperation, political, evidence quality, jurisdictional, bureaucratic, legal limits, limited skillsets, scope, and understaffing*.

In light of these observations and characterizations, Inspectors General studies have followed a common fiber of testing the limits of the role and responsibilities in the atmosphere of restriction and limits. Research in this area has identified traits for success (Harris, 2014), strategies for effective use of limited authority (Harris, 2012), and room for adaptation in even more restrictive and even authoritarian climates (Feldman, 2017).

Appendixes

Appendix A: Recruitment Script

CITY UNIVERSITY OF NEW YORK

The Graduate Center & John Jay College
Departments of Criminal Justice

RECRUITMENT SCRIPT

Hi, my name is Lawrence Kom. I am doctoral student at The Graduate Center, City University of New York. I am conducting a research study designed to identify the aids and impediments to investigations of Fraud, Waste, Abuse, and Corruption. The results of this study may aid in the development of new investigative techniques and increase awareness of aids and obstructions to investigations of this manner.

I'd like to ask you questions about your current and prior investigative positions as well as some notable cases of fraud, waste, abuse, or corruption you investigated. This will take up to 30 minutes.

If you are interested in participating, I will provide you with a consent form to sign (*or verbally agree to, in case of phone interview*) that provides more details about the study and the protections I am employing to protect participant confidentially.

Are you interested in participating in this study?

Appendix B: Informed Consent Form

CITY UNIVERSITY OF NEW YORK

The Graduate Center & John Jay College
Departments of Criminal Justice

CONSENT TO PARTICPATE IN A RESEARCH PROJECT

Title of Research Study: Investigations of Fraud, Waste, Abuse, and Corruption in the Public Sector: A Survey of Organizational and Software-Based Aids and Obstructions

Principal Investigator: Lawrence Kom, MPA
Doctoral Candidate
The Graduate Center, CUNY

Faculty Advisor: Warren Benton, Ph.D.
Professor & Chairperson
John Jay College of Criminal Justice
Public Management

You are invited to participate in a research study because of your experience with investigating cases of fraud, waste, abuse, or corruption.

Purpose:

The purpose of this research study is to better understand the aids and impediments to investigations of Fraud, Waste, Abuse, and Corruption. The results of this study may aid in the development of new investigative techniques and increase awareness of aids and obstructions to investigations of this manner.

Procedures:

If you volunteer to participate in this research study, we will ask you to do the following:

- Answer questions about your current and former investigative positions and details about the task and scope of these positions.
- Answer questions about cases you've investigated that you believe meet the criteria of major cases of fraud, waste, abuse, or corruption.

Time Commitment:

Your participation in this research study is expected to last for a total of 30 minutes.

Potential Risks or Discomforts:

To minimize any risks of performance disclosure no subjects will be identified by this study and specific organizational and investigation attributes will not be connected to specific responses.

If you decide to withdraw from this study, please contact the principal investigator Lawrence Kom to inform them of your decision.

Potential Benefits:

- You will not directly benefit from your participation in this research study.
- Participating in the study may increase general knowledge of, and improvement of, investigative techniques for Fraud, Waste, Abuse, and Corruption.

Payment for Participation:

You will not receive any payment for participating in this research study.

New Information:

You will be notified about any new information regarding this study that may affect your willingness to participate in a timely manner.

Confidentiality:

We will make our best efforts to maintain confidentiality of any information that is collected during this research study, and that can identify you. We will disclose this information only with your permission or as required by law.

We will protect your confidentiality by both coding the data and encrypting it. The collected data will be stored on an encrypted hard drive. An entirely separate encrypted hard drive, utilizing FileVault (OS X) and BitLocker (Windows) software will be used to store the consent records and any other identifiable matching records.

The research team, authorized CUNY staff, and government agencies that oversee this type of research may have access to research data and records in order to monitor the research. Research records provided to authorized, non-CUNY individuals will not contain identifiable information about you. Publications and/or presentations that result from this study will not identify you by name.

Participants' Rights:

- Your participation in this research study is entirely **voluntary**. If you decide not to participate, there will be no penalty to you, and you will not lose any benefits to which you are otherwise entitled.
- You can decide to withdraw your consent and stop participating in the research at any time, without any penalty.

Questions, Comments or Concerns:

If you have any questions, comments or concerns about the research, you can talk to one of the following researchers:

- Lawrence Kom, Doctoral Candidate, Telephone: 815.277.9566, Email: lkom@gc.cuny.edu

If you have questions about your rights as a research participant, or you have comments or concerns that you would like to discuss with someone other than the researchers, please call the CUNY Research Compliance Administrator at 646-664-8918 or email HRPP@cuny.edu. Alternately, you can write to:

CUNY Office of the Vice Chancellor for Research
Attn: Research Compliance Administrator

205 East 42nd Street
New York, NY 10017

Signature of Participant:

If you agree to participate in this research study, please sign and date below. You will be given a copy of this consent form to keep.

Printed Name of Participant

Signature of Participant

Date

Signature of Individual Obtaining Consent

Printed Name of Individual Obtaining Consent

Signature of Individual Obtaining Consent

Date

Appendix C: Survey Instrument

Survey Overview:

Question sequence will be asked for each incident type (fraud, waste, abuse, and corruption). Interviewees will be asked same questions in the same sequence for a critical success and failure incident. Each interviewee will decide whether success is first or second in order. At the conclusion of the critical success or failure sequence, each individual will be asked for another similar incident that took place when they used different Fraud, Waste, Abuse, and Corruption (FWAC) software tools.²

The critical incident technique calls for probing questions that are framed in the context of success and failure in regard to the general aim of a position. In the context of this study, the General Aim is to investigate potential fraud, waste, abuse, and corruption (FWAC)—although one would attribute success to instances of FWAC with a successful legal outcome on behalf of the agency, an unobstructed investigation is more aligned with successful execution of the duties for that position. As such, critical success would be investigations that were not substantially hindered.

Incident types:

1. Fraud – intentional deception committed to conceal actions or transactions.
2. Waste –the use of financial and material resources or personnel for purposes not directly related to the execution of duties and responsibilities of the organization.
3. Abuse – the misuse, allocation or improper treatment of financial or material resources or personnel to perform tasks and activities which may be directly or indirectly related to the execution of duties and responsibilities of the organization.
4. Corruption – use of power for activities not authorized by position

Survey Questions:

1. Current Investigative Role:
 - a. What is your current work position?
 - b. When did you take this position?
 - c. How many investigators work in your investigative office?
 - d. Roughly how many employees in your agency or organization is your investigative office in charge of monitoring?
 - e. What is the general aim of your investigative office?
2. What were your previous work positions and when were they?

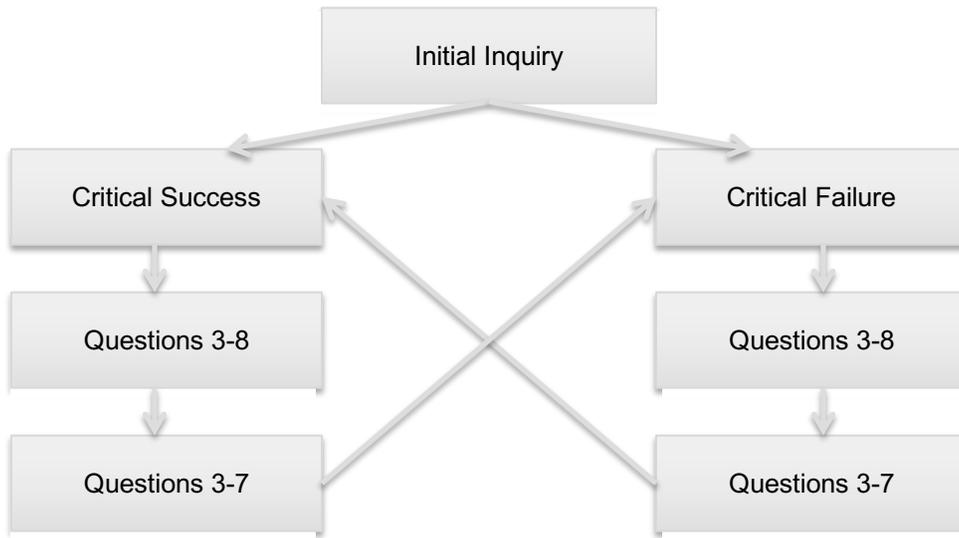
Think of the last major case of [incident type, description of incident type], that you investigated, [on second pass: “that occurred with/without significant obstacles.”]

3. What made this incident significant?
4. Were there obstacles that prevented a thorough investigation from being conducted?
[On second pass: Skip to ‘4b’ or #5, without reading question #4]
 - a. (Yes=Critical Success, No=Critical Failure)
 - b. What were those obstacles?
5. Would you briefly describe the facts of this incident?
 - a. When did this incident occur?
 - b. Who, by position title, was involved in the incident?
 - c. If applicable, what or how much was missing?

² FWAC software is any software used to detect, uncover, organize, evaluate, make calculations on, or otherwise investigate evidence relevant to an investigation of Fraud, Waste, Abuse, or Corruption.

- d. Who, by role, was involved in the investigation?
- 6. Did you use any software to materially assist you in performing the investigation functions for this incident of [incident type]?
 - a. If yes:
 - i. Which software did you use?
 - ii. Which specific features did you find useful in this investigation?
 - b. If no:
 - iii. Was there a specific software feature or features that could have been useful to you in this investigation?
 - c. Were there any software-related issues that hindered your investigation, either due to: (Ask each)
 - iv. Software limitations? What was the workaround?
 - v. Software usage difficulties? What was the workaround?
 - vi. Other factors? What was the workaround?
- 7. Which of the following outcomes can be attributed to this incident? (Check off each)
 - a. Criminal Charges?
 - b. Indictment?
 - c. Termination?
 - d. Arrest?
 - e. Conviction?
 - f. Financial Recovery: (Pick one)
 - vii. Full 100%
 - viii. Greater than 50%
 - ix. Less than 50%
 - x. No Recovery
 - g. Case still pending?
 - h. Other? Specify.
- 8. Can you think of another significant case of [incident type] in the past similar to this one, either in your current position or a past position, where you were using different software for material support in your investigation?
 - a. [Repeat Questions 3 through 7]

Inquiry structure:



Appendix D: Tables & Figures

Figure 1. Breakdown of respondent job positions.

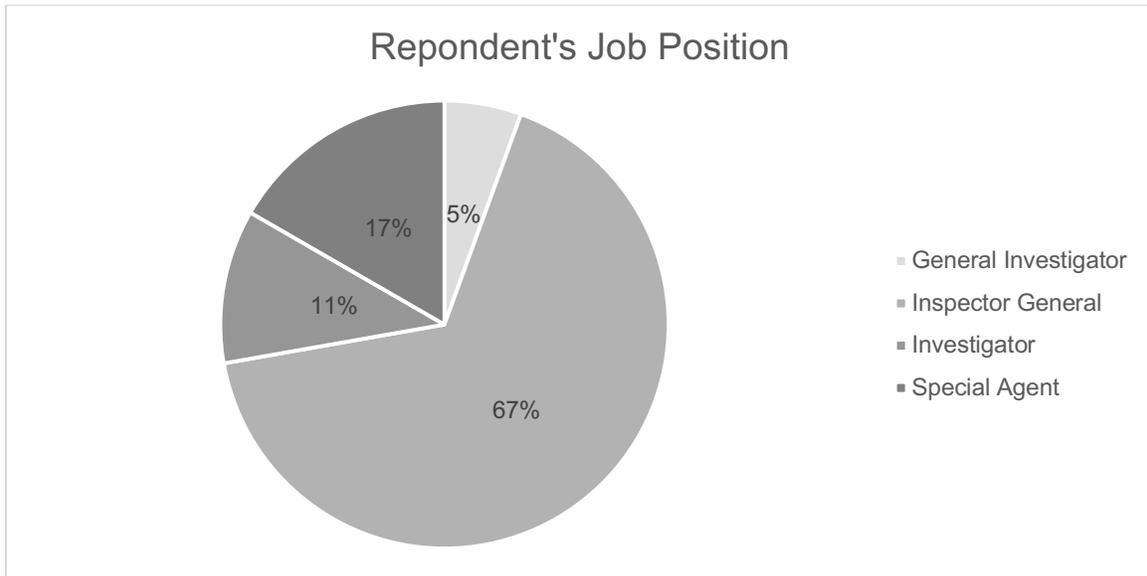


Figure 2. Total cases of Fraud, Waste, Abuse, and Corruption collected.

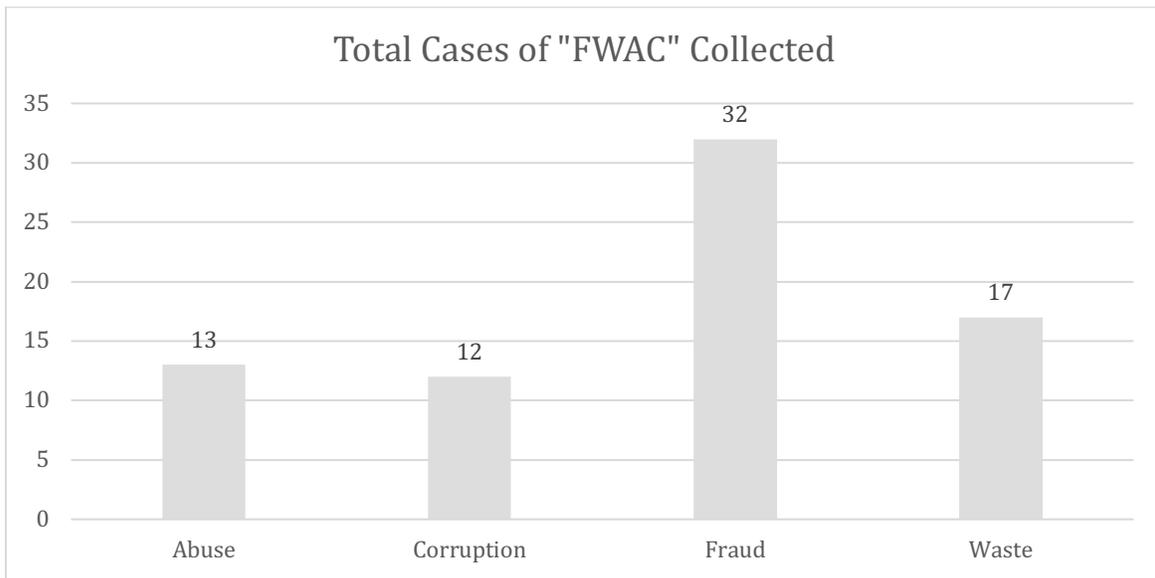


Figure 3. Fraud, waste, abuse, and corruption cases investigated by year.

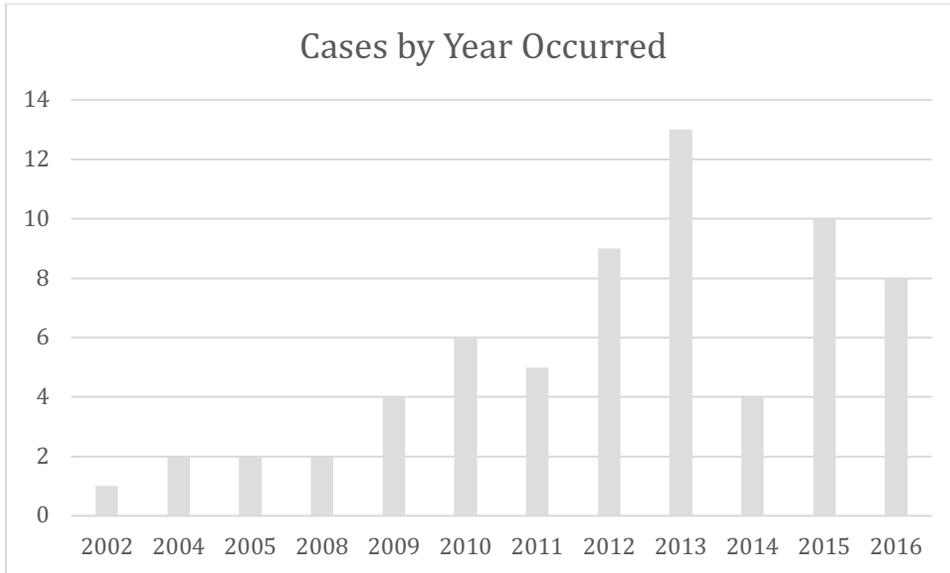


Figure 4. Fraud, waste, abuse, and corruption cases by financial amount missing or in question.

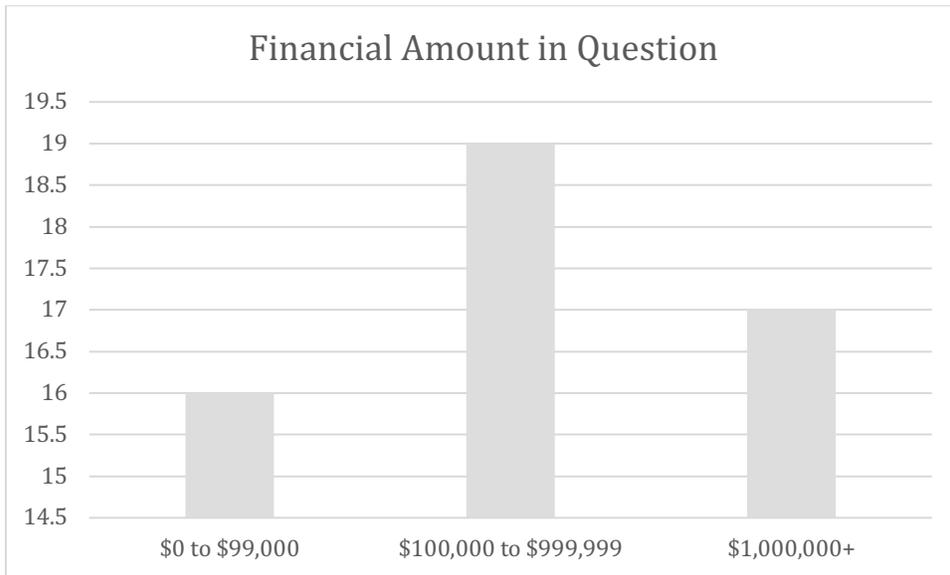


Figure 5. Thematic analysis of investigator mission.

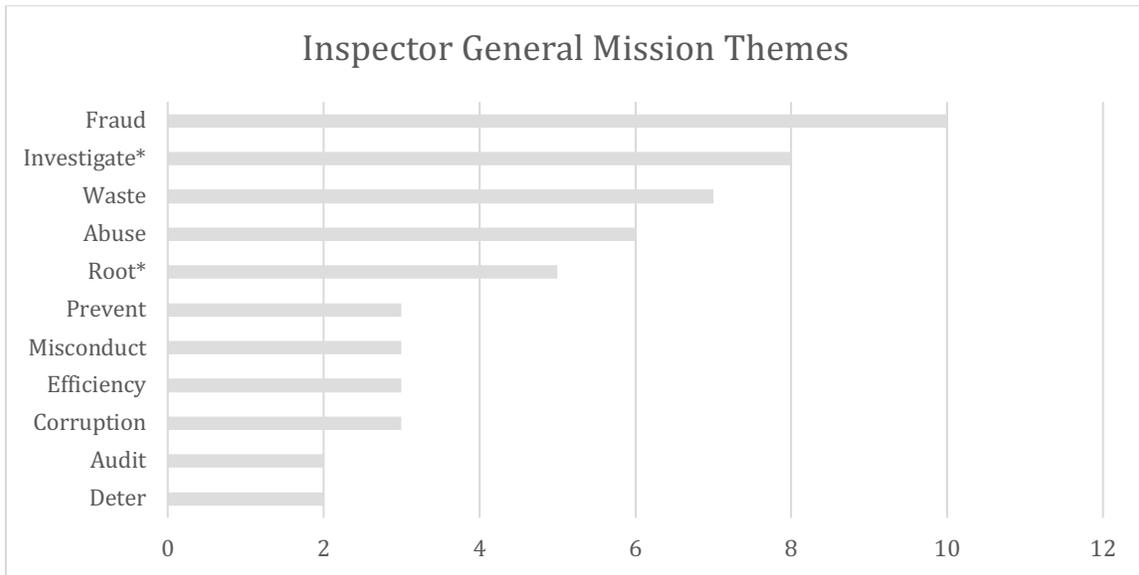


Table 1. Total respondents, cases collected by type.

METRIC	COUNT
TOTAL RESPONDENTS	19
TOTAL CASES	74
ABUSE	13
CORRUPTION	12
FRAUD	32
WASTE	17

Table 2. Respondent employment and organizational attributes.

Position	Previous Position	Years in Current Position	Size of Investigative Office	Size of Agency Investigated
General Investigator	Probation Officer	2	5	100
Inspector General	Unknown	2	350	25,000
Inspector General	Attorney	5	30	50,000
Inspector General	Inspector General	6	4	20,000
Inspector General	Investigator	2	6	-
Inspector General	Police	5	2	9,000
Inspector General	Auditor	4	13	4,000
Inspector General	Investigator	5	17	-
Inspector General	Attorney General Office	1	12	-
Inspector General	Unknown	11	13	-
Inspector General	Special Agent	16	10	7,000
Inspector General	Military	1	1	600
Inspector General	Auditor	3	9	500
Investigator	Attorney	2	4	4,000
Investigator	Military	4	10	4,800
Special Agent	Investigator	13	15	60,000
Special Agent	Investigator	1	600	500,000
Special Agent	Unknown	2	38	160,000

Table 3. Matching cases by reason for significance.

REASON FOR SIGNIFICANCE	MATCHING CASES
FINANCIAL AMOUNT	17
VULNERABLE GROUP	15
MISAPPROPRIATION	12
HIGH RANKING OFFICAL	8
ABUSE OF PRIVILEGE	6
PUBLIC DISPLAY OF ABUSE	5
NUMBER INVOLVED	3
CORRUPT PUBLIC SERVANT	3
LAW ENFORCEMENT CORRUPTION	3
AGGRESSIVE ADVERSARY	2
BRIBERY	2
GOOD INVESTIGATION	2
PUBLIC SAFETY	2
CLEAR REMEDY	1
JAILTIME	1
WENT TO TRIAL	1

Table 4. Matching cases by macro reason for significance.

CATEGORY	MATCHING CASES
AMOUNT	17
FINANCIAL AMOUNT	17
VULNERABLE GROUP	15
VULNERABLE GROUP	15
OTHER NOTABILITY	14
AGGRESSIVE ADVERSARY	2
BRIBERY	2
CLEAR REMEDY	1
GOOD INVESTIGATION	2
NUMBER INVOLVED	3
PUBLIC SAFETY	2
WENT TO TRIAL	1
JAILTIME	1
POSITION OF SUSPECT	14
CORRUPT PUBLIC SERVANT	3
HIGH RANKING OFFICAL	8
LAW ENFORCEMENT CORRUPTION	3
MISAPPROPRIATION	12
MISAPPROPRIATION	12
ABUSE OF POWER	11
ABUSE OF PRIVILEGE	6
PUBLIC DISPLAY OF ABUSE	5
GRAND TOTAL	83

Table 5. Total cases, critical success or failure, and success rate by type.

CASE TYPE	CASES	SUCCESS CASES	FAILURE CASES	SUCCESS RATE
FRAUD	32	12	20	37.50%
WASTE	17	8	9	47.06%
ABUSE	13	5	8	38.46%
CORRUPTION	12	3	9	25.00%
	74	28	46	37.01%

Table 6. Total cases, critical success or failure, and success rate by type, for cases not pending outcome only.

CASE TYPE	CASES	SUCCESS CASES	FAILURE CASES	SUCCESS RATE
FRAUD	18	5	13	27.78%
WASTE	14	6	8	42.86%
ABUSE	10	4	6	40.00%
CORRUPTION	9	2	7	22.22%
	51	17	34	33.21%

Table 7. Obstacle themes and matching case counts.

CATEGORY	COUNT
SUSPECT COOPERATION	14
EVIDENCE QUALITY	13
POLITICAL	13
JURISDICTIONAL	9
BUREACRATIC	8
LEGAL LIMITS	6
LIMITED SKILLSETS	4
SCOPE	3
UNDERSTAFFING	3

Table 8. Obstacle themes and specific obstacle breakdowns.

OBSTACLE	COUNT
SUSPECT COOPERATION	14
AGGRESSIVE ADVERSARY	1
COLLUSION, SOMEONE ALERTED SUSPECT	1
DIRECTOR UNCOOPERATIVE, STALLED, WITHHELD RECORDS, HIRED ATTORNEY	1
LACK OF COOPERATION	2
MISSING INFORMATION FROM SUSPECT	1
ORIGINAL EMPLOYEES NO LONGER WITH GOVERNMENT	1
REFUSED TO PROVIDE RECORDS, RETAINED COUNSEL	1
RESISTANCE FROM EMPLOYEES TO CHANGE	1
LONGSTANDING CORRUPTION	
SUSPECT ALREADY LEFT POSITION	1
SUSPECT RETAINED LEGAL COUNSEL	2
SUSPECTS PREVENTED INFORMATION SHARING WITH TOP	1
WITHHOLDING INFORMATION, CONTRADICTION STATEMENTS	1
POLITICAL	13
BUSINESS HAD CLOSE TIES	1
CITY MANAGEMENT WAS APPREHENSIVE	1
EXECUTIVE DIRECTOR STALLED	1
FEAR OF RETALIATION, "OLD SCHOOL" MENTALITY	1
HINDERED BY SUSPECT'S POLITICAL CONNECTIONS	1
LACK OF HIGHER MANAGEMENT COOPERATION	1
LEADERSHIP BIAS DESPITE BRIBERY ALLEGATIONS	1
LEGAL ATTENTION AND HURDLES DUE TO GOVERNMENT	1
MISTAKES	
NO POPULAR OPINION TO ARREST	1
POLITICAL OBSTACLES	1
SENIOR PLAYERS UNAWARE OF IG AUTHORITY	1
TARGET WAS POLICE COMMANDER, SWORN STATUS	1
WELL CONNECTED	1
EVIDENCE QUALITY	13
1980S DATA SYSTEMS, UNABLE TO GENERATE FORMAT NEEDED	1
COMPLAINANT HAD REPUTATION FOR DISHONESTY	1
FALSIFIED DOCUMENTS	1
INADEQUATE RECORDS WITH CONTRACTOR	1
LACK OF DOCUMENTS, OLD TESTIMONY	1
LACK OF RECORD KEEPING, LACK OF DOCUMENTED PROCEDURES, POOR DOCUMENT FOR CHAIN OF CUSTODY	1
MAJORITY OF INTERVIEW WAS FALSIFIED INFORMATION	1
MISSING RECORDS	1
SMART TECH PEOPLE HID MONEY WELL.	1
SUSPECT TAMPERED WITH EVIDENCE IN DATABASE	1
UNDER REPORTING, INACCURATE REPORTING	1

VIDEO EVIDENCE FAILURE, BECAME HIS WORD VS HIS WORD	1
JURISDICTIONAL	9
COMPETING AUDITING AGENCIES	1
DEALING WITH OTHER STATE AGENCIES	1
INTERAGENCY RELATIONSHIP/ROLES	1
INTERAGENCY DIFFERENCES	1
INTERAGENCY DISPUTE ABOUT OWNING PROCESS, EVIDENCE, RELEASE	1
JURISDICTIONAL ISSUES, DIFFERING SOFTWARE	1
NEEDED TO FIND TRAVEL MONEY	1
PARALLEL FEDERAL INVESTIGATION	1
SEVERAL AGENCIES INVOLVED	1
BUREACRATIC	8
AGENCY SHOULD HAVE DISCOVERED IT	1
CHALLENGE OF WORKING WITH POLICE	1
CHALLENGING JURISDICTION TO NAVIGATE	1
DELAY IN SUBPOENA RESPONSES	1
INADEQUATE PROSECUTION	1
MANAGEMENT WANTED INFO BEFORE INVESTIGATION COMPLETE	1
PUBLIC OFFICIALS WROTE LAWS AND KNEW WAY AROUND THEM	1
SUSPECT COULD REVIEW ALL TESTIMONY	1
LEGAL LIMITS	6
INSUFFICIENT SUBPOENA POWER	1
LACK OF INDEPENDENCE	1
LIMITED POWER	1
NEEDED COURT ORDER TO GET CORRECT SUBPOENA	1
NO SUBPOENA POWER, SUSPECTS RETAINED COUNSEL, REFUSED TESTIMONY	1
STATUTE OF LIMITATIONS	1
LIMITED SKILLSETS	4
INSUFFICIENT STAFF TRAINING BEFORE ON-THE-JOB	1
LACK OF STAFF EXPERTISE	1
NEW TECHNOLOGY	1
NOT ENOUGH ABILITY TO ASSES OR RESOLVE	1
SCOPE	3
COMPLEX, LOTS OF DOCUMENTS	1
TIME AND VOLUME OF CASE MATERIAL	2
UNDERSTAFFING	3
INSUFFICIENT RESOURCES	2
NOT ENOUGH MANPOWER	1

Table 9. Types of software used for each case.

TYPE OF SOFTWARE	MATCHING CASES
SPREADSHEETS	48
DATABASE	16
CASE MANAGEMENT	8
FORENSICS	15
OTHER	3

Table 10. Case outcomes by case type with no pending additional outcomes.

	TOTAL	CHARGE	INDICTMENT	TERMINATION	ARREST	CONVICTION
ABUSE	10	3	4	3	4	3
CORRUPTION	9	5	1	3	4	3
FRAUD	18	13	9	10	11	11
WASTE	14	0	0	5	0	0
TOTAL	51	21	14	21	19	17

Table 11. Case outcomes by case type with no pending additional outcomes as percentage of total outcomes for each outcome type.

	TOTAL	CHARGE	INDICTMENT	TERMINATION	ARREST	CONVICTION
ABUSE	19.61%	14.29%	28.57%	14.29%	21.05%	17.65%
CORRUPTION	17.65%	23.81%	7.14%	14.29%	21.05%	17.65%
FRAUD	35.29%	61.90%	64.29%	47.62%	57.89%	64.71%
WASTE	27.45%	0.00%	0.00%	23.81%	0.00%	0.00%
TOTAL	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 12. Case outcomes by case type with pending additional outcomes.

	TOTAL	CHARGE	INDICTMENT	TERMINATION	ARREST	CONVICTION
ABUSE	3	1	1	0	0	0
CORRUPTION	3	2	1	1	1	2
FRAUD	14	8	4	7	6	3
WASTE	3	0	0	0	0	0
TOTAL	23	11	6	8	7	5

OUTPUT 1. Predicting legal outcome of case based on ability to conduct thorough investigation.

Case Processing Summary

Unweighted Cases ^a		N	Percent
Selected Cases	Included in Analysis	74	100.0
	Missing Cases	0	.0
	Total	74	100.0
Unselected Cases		0	.0
Total		74	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Block 0: Beginning Block

Classification Table^{a,b}

	Observed		Predicted		Percentage Correct
			OUTCOME_LEGAL 0	OUTCOME_LEGAL 1	
Step 0	OUTCOME_LEGAL	0	0	31	.0
		1	0	43	100.0
Overall Percentage					58.1

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 0 Constant	.327	.236	1.929	1	.165	1.387

Variables not in the Equation

	Score	df	Sig.
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Step 0	Variables	CRITICAL_SUCCESS	.381	1	.537
	Overall Statistics		.381	1	.537

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	.380	1	.538
	Block	.380	1	.538
	Model	.380	1	.538

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	100.251 ^a	.005	.007

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Table^a

Observed		Predicted		Percentage Correct
		OUTCOME_LEGAL 0	1	
Step 1	OUTCOME_LEGAL 0	0	31	.0
	1	0	43	100.0
Overall Percentage				58.1

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	CRITICAL_SUCC ESS	-.299	.485	.380	1	.538	.742
	Constant	.442	.302	2.139	1	.144	1.556

a. Variable(s) entered on step 1: CRITICAL_SUCCESS.

OUTPUT 2. Predicting policy outcome of case based on ability to conduct thorough investigation.

Case Processing Summary

Unweighted Cases ^a		N	Percent
Selected Cases	Included in Analysis	74	100.0
	Missing Cases	0	.0
	Total	74	100.0
Unselected Cases		0	.0
Total		74	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Block 0: Beginning Block

Classification Table^{a,b}

	Observed		Predicted		Percentage Correct
			OUTCOME_POLICY 0	OUTCOME_POLICY 1	
Step 0	OUTCOME_POLICY	0	42	0	100.0
		1	32	0	.0
Overall Percentage					56.8

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 0 Constant	-.272	.235	1.343	1	.246	.762

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	CRITICAL_SUCCESS	.003	1	.958
	Overall Statistics		.003	1	.958

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	.003	1	.958
	Block	.003	1	.958
	Model	.003	1	.958

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	101.228 ^a	.000	.000

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Table^a

	Observed	Predicted		Percentage Correct
		OUTCOME_POLICY 0	OUTCOME_POLICY 1	
Step 1	OUTCOME_POLICY 0	42	0	100.0
	OUTCOME_POLICY 1	32	0	.0
Overall Percentage				56.8

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	CRITICAL_SUCCESS	-.025	.484	.003	1	.958	.975
	Constant	-.262	.297	.778	1	.378	.769

a. Variable(s) entered on step 1: CRITICAL_SUCCESS.

OUTPUT 3. Predicting recovery outcome of case based on ability to conduct thorough investigation.

Case Processing Summary

Unweighted Cases ^a		N	Percent
Selected Cases	Included in Analysis	74	100.0
	Missing Cases	0	.0
	Total	74	100.0
Unselected Cases		0	.0
Total		74	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Block 0: Beginning Block

Classification Table^{a,b}

	Observed	Predicted		Percentage Correct
		OUTCOME_RECOVER 0	OUTCOME_RECOVER 1	
Step 0	OUTCOME_RECOVER 0	47	0	100.0
	Y 1	27	0	.0
Overall Percentage				63.5

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 0 Constant	-.554	.241	5.269	1	.022	.574

Variables not in the Equation

		Score	df	Sig.
Step 0	Variables CRITICAL_SUCCESS	.012	1	.914
	Overall Statistics	.012	1	.914

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	.012	1	.914
	Block	.012	1	.914
	Model	.012	1	.914

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	97.101 ^a	.000	.000

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Table^a

	Observed	OUTCOME_RECOVER	Predicted		Percentage Correct
			0	1	
Step 1	OUTCOME_RECOVER	0	47	0	100.0
	Y	1	27	0	.0
	Overall Percentage				63.5

a. The cut value is .500

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
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Step 1 ^a	CRITICAL_SUCC ESS	-.054	.499	.012	1	.914	.948
	Constant	-.534	.305	3.057	1	.080	.586

a. Variable(s) entered on step 1: CRITICAL_SUCCESS.

OUTPUT 4. Predicting termination outcome of case based on ability to conduct thorough investigation.

Case Processing Summary

Unweighted Cases ^a		N	Percent
Selected Cases	Included in Analysis	74	100.0
	Missing Cases	0	.0
	Total	74	100.0
Unselected Cases		0	.0
Total		74	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Block 0: Beginning Block

Classification Table^{a,b}

	Observed	OUTCOME_TERMINAT E	Predicted		Percentage Correct
			0	1	
Step 0	OUTCOME_TERMINAT E	0	0	36	.0
		1	0	38	100.0
Overall Percentage					51.4

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 0 Constant	.054	.233	.054	1	.816	1.056

Variables not in the Equation

		Score	df	Sig.
Step 0	Variables CRITICAL_SUCCESS	.033	1	.856
Overall Statistics		.033	1	.856

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	.033	1	.856
	Block	.033	1	.856
	Model	.033	1	.856

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	102.499 ^a	.000	.001

a. Estimation terminated at iteration number 2 because parameter estimates changed by less than .001.

Classification Table^a

Observed		Predicted		Percentage Correct
		OUTCOME_TERMINAT E 0	1	
Step 1	OUTCOME_TERMINAT E 0	0	36	.0
	1	0	38	100.0
Overall Percentage				51.4

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	CRITICAL_SUCCESS	-.087	.480	.033	1	.856	.917
	Constant	.087	.295	.087	1	.768	1.091

a. Variable(s) entered on step 1: CRITICAL_SUCCESS.

OUTPUT 5. Predicting legal outcome of case based on material use of software to aid investigation.

Case Processing Summary

Unweighted Cases ^a		N	Percent
Selected Cases	Included in Analysis	74	100.0
	Missing Cases	0	.0
	Total	74	100.0
Unselected Cases		0	.0
Total		74	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Block 0: Beginning Block

Classification Table^{a,b}

		Observed	Predicted		Percentage Correct
			OUTCOME_LEGAL 0	OUTCOME_LEGAL 1	
Step 0	OUTCOME_LEGAL	0	0	31	.0
		1	0	43	100.0
		Overall Percentage			58.1

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.327	.236	1.929	1	.165	1.387

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	SOFTWARE_ASSIST	5.047	1	.025
	Overall Statistics		5.047	1	.025

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	5.048	1	.025
	Block	5.048	1	.025
	Model	5.048	1	.025

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	95.583 ^a	.066	.089

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Classification Table^a

	Observed		Predicted		Percentage Correct
			OUTCOME_LEGAL 0	OUTCOME_LEGAL 1	
Step 1	OUTCOME_LEGAL 0	0	8	23	25.8
	OUTCOME_LEGAL 1	1	3	40	93.0
Overall Percentage					64.9

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	SOFTWARE_AS SIST	1.534	.726	4.468	1	.035	4.638
	Constant	-.981	.677	2.099	1	.147	.375

a. Variable(s) entered on step 1: SOFTWARE_ASSIST.

OUTPUT 6. Predicting policy outcome of case based on material use of software to aid investigation.

Case Processing Summary

Unweighted Cases ^a		N	Percent
Selected Cases	Included in Analysis	74	100.0
	Missing Cases	0	.0
	Total	74	100.0
Unselected Cases		0	.0
Total		74	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Block 0: Beginning Block

Classification Table^{a,b}

	Observed		Predicted		Percentage Correct
			OUTCOME_POLICY 0	OUTCOME_POLICY 1	
Step 0	OUTCOME_POLICY	0	42	0	100.0
		1	32	0	.0
Overall Percentage					56.8

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 0 Constant	-.272	.235	1.343	1	.246	.762

Variables not in the Equation

	Score	df	Sig.
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Step 0	Variables	SOFTWARE_ASSIST	.026	1	.873
	Overall Statistics		.026	1	.873

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	.026	1	.873
	Block	.026	1	.873
	Model	.026	1	.873

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	101.205 ^a	.000	.000

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Table^a

	Observed		Predicted		Percentage Correct
			OUTCOME_POLICY 0	1	
Step 1	OUTCOME_POLICY	0	42	0	100.0
		1	32	0	.0
	Overall Percentage				56.8

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	SOFTWARE_AS SIST	-.105	.657	.026	1	.873	.900
	Constant	-.182	.606	.091	1	.763	.833

a. Variable(s) entered on step 1: SOFTWARE_ASSIST.

OUTPUT 7. Predicting recovery outcome of case based on material use of software to aid investigation.

Case Processing Summary

Unweighted Cases ^a		N	Percent
Selected Cases	Included in Analysis	74	100.0
	Missing Cases	0	.0
	Total	74	100.0
Unselected Cases		0	.0
Total		74	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Block 0: Beginning Block

Classification Table^{a,b}

	Observed	Predicted		Percentage Correct
		OUTCOME_RECOVER		
		0	1	
Step 0	OUTCOME_RECOVER 0	47	0	100.0
	Y 1	27	0	.0
Overall Percentage				63.5

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 0 Constant	-.554	.241	5.269	1	.022	.574

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	SOFTWARE_ASSIST	1.868	1	.172
Overall Statistics			1.868	1	.172

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	2.047	1	.153
	Block	2.047	1	.153
	Model	2.047	1	.153

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	95.066 ^a	.027	.037

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Classification Table^a

		Predicted OUTCOME_RECOVER		Percentage Correct	
		Y 0	1		
Step 1	Observed				
	OUTCOME_RECOVER	0	47		0
	Y	1	27	0	.0
Overall Percentage				63.5	

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	SOFTWARE_AS SIST	1.085	.823	1.739	1	.187	2.961
	Constant	-1.504	.782	3.702	1	.054	.222

a. Variable(s) entered on step 1: SOFTWARE_ASSIST.

OUTPUT 8. Predicting termination outcome of case based on material use of software to aid investigation.

Case Processing Summary

Unweighted Cases ^a		N	Percent
Selected Cases	Included in Analysis	74	100.0
	Missing Cases	0	.0
	Total	74	100.0
Unselected Cases		0	.0
Total		74	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Block 0: Beginning Block

Classification Table^{a,b}

	Observed	Predicted		Percentage Correct
		OUTCOME_TERMINAT		
		0	1	
Step 0	OUTCOME_TERMINAT 0	0	36	.0
	E 1	0	38	100.0
Overall Percentage				51.4

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 0 Constant	.054	.233	.054	1	.816	1.056

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	SOFTWARE_ASSIST	1.162	1	.281
Overall Statistics			1.162	1	.281

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	1.172	1	.279
	Block	1.172	1	.279
	Model	1.172	1	.279

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	101.360 ^a	.016	.021

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Table^a

Observed		Predicted		Percentage Correct
		OUTCOME_TERMINAT 0	OUTCOME_TERMINAT 1	
Step 1	OUTCOME_TERMINAT 0	7	29	19.4
	OUTCOME_TERMINAT 1	4	34	89.5
Overall Percentage				55.4

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	SOFTWARE_ASSIST	.719	.676	1.131	1	.288	2.052
	Constant	-.560	.627	.797	1	.372	.571

a. Variable(s) entered on step 1: SOFTWARE_ASSIST.

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