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Investigators' Perceptions of Inter-Jurisdictional Law Enforcement Information Sharing On Criminal Investigative Success: An Exploratory Analysis

Jennifer Freeman-Walker
University of Central Florida

INVESTIGATORS' PERCEPTIONS OF INTER-JURISDICTIONAL LAW
ENFORCEMENT INFORMATION SHARING ON CRIMINAL
INVESTIGATIVE SUCCESS: AN EXPLORATORY ANALYSIS

by

JENNIFER FREEMAN-WALKER
B.S. Florida Southern College, 2001
M.S. University of Central Florida, 2006

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ABSTRACT

Information sharing among law enforcement entities became a national priority after the 9/11 attack (Carter, 2005). Various information systems utilized by law enforcement agencies may be promising; however, there is little extant empirical research to validate the system's effectiveness related to increasing investigative success (Bureau of Justice Assistance, 2010). One information system that has tied together numerous Florida law enforcement agencies is the FINDER system. FINDER, the Florida Integrated Network for Data Exchange and Retrieval system, provides agency investigators a wide range of information not previously available (Reynolds, Griset, & Scott, 2006; Scott, 2006). This study's foundation was primarily based upon the conceptual frameworks of diffusion of innovations and knowledge management. Survey based information from investigators using FINDER and those using a non-FINDER information system was obtained and analyzed to determine if the information impacted investigative success. Questionnaires were sent to those law enforcement investigators that participate in the FINDER system, as well as those who use a non-FINDER system. Through descriptive and regression analysis, it was found that FINDER participants reported there was a positive contribution to investigative success. The research also found that certain information obtained from FINDER assisted in arrests and an investigator's ability to solve cases. This study provides a foundation for further information system research related to case solvability and investigative success.

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CHAPTER 1: INTRODUCTION

9/11 and Information Sharing

Criminal offenders are mobile and commit criminal acts in multiple jurisdictions (Chen et al., 2002). The lack of information sharing among law enforcement entities can create barriers to effectively prevent and solve crime. The barriers apply directly to investigators and subsequently to the investigative success of solving criminal cases. Although many outside the field of law enforcement may believe that information sharing among the various law enforcement entities is routine and readily available to all agencies, this is not the case. Law enforcement agencies have traditionally been reluctant to share information with one another for a number of reasons, and this was especially true prior to 9/11 (Geoghegan, 2007; Reynolds, Griset, & Scott, 2006).

On September 11, 2001, the 9/11 event abruptly changed the urgency of information sharing among law enforcement entities. The event itself, and subsequent investigations, permanently changed the way law enforcement viewed the need to share information among one another (Carter, 2005). These events compelled the law enforcement community, at all levels of responsibility, to focus on "connecting-the-dots" (Carter & Carter, 2009). The *9/11 Commission Report*, the Markle Foundation Task Force, Congress, the president, and many other major stakeholders demanded a rapid reform of information sharing (Budinger & Smith, 2011; National Commission on Terrorist Attacks Upon the United States, 2004).

Effective law enforcement information sharing is a critical area that must be improved to increase the probability of detecting and solving crime. Investigative success depends on timely

and accurate information available to investigators and analysts from all-sources. Now, a decade after 9/11, there are wide-area law enforcement information systems in operation that can be used to assist investigators, crime analysts, and intelligence analysts. There is a large gap in the research literature related to how inter-agency law enforcement sharing has impacted investigations. There is an assumption that the ability to "connect-the-dots" through inter-agency information sharing will increase investigative success. This study examines the impact of information sharing on criminal investigations and more specifically focuses on the factors related to case solvability and investigative success.

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Significance of Study
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There is currently little empirical research to validate information system effectiveness. According to the Bureau of Justice Assistance, Center for Program Evaluation and Performance Measurement (2010), information sharing and integration initiatives is still a "relatively new area of study" (p. 1) and many of the extant studies have focused on system implementation (Arkansas IJIS Office, 2002; Bureau of Justice Assistance, 2004; Chen, Zeng, Atabakhsh, Wyzga, & Schroeder, 2003), along with the usability of the system by law enforcement personnel (Chen et al., 2002; Hauck & Chen, 1999). In many situations, the information sharing system's effectiveness pertaining to investigative success, including solving cases, and preventing crime has not been fully explored (Bureau of Justice Assistance, 2010). This is ironic considering one of the major reasons cited for the 9/11 failure was the inability to "connect-the-dots," or share information effectively from the federal to state to local levels (Budinger &

Smith, 2011; Reveron, 2007). The failure to "connect-the-dots", or share all source law enforcement information, is a major detriment for investigative case success.

One information system that has successfully connected over 100 law enforcement agencies (The Center for Law Enforcement Technology, Training, & Research, 2011) across the state of Florida is the FINDER information sharing system. FINDER, the Florida Integrated Network for Data Exchange and Retrieval, became operational in 2002 and was developed in partnership between the University of Central Florida's Public Safety Technology Center and the grassroots practitioner based Florida Law Enforcement Data Sharing Consortium (LEDSC) (Geoghegan, 2007; Reynolds et al., 2006). FINDER allows law enforcement agencies electronic access to low-level information that could now be obtained within minutes versus days, weeks, or not at all; as was typical prior to real-time inter-agency information sharing (Geoghan, 2007, Reynolds et al., 2006). Low-level information refers to data that is collected primarily by local law enforcement officials, such as incident reports, calls for service, field information reports, traffic citations, etc. (Reynolds et al., 2006; Scott, 2006).

This study focuses on the notion of investigative success, which also encompasses case solvability. There is little empirical research focused on the factors that impact and increase the probability of solving cases or improving the success within investigations. Valid information is needed in order to assist in solving cases and hence, information sharing among law enforcement agencies is crucial, especially since criminals cross jurisdictional boundaries to reside and offend.

Theoretical Framework

A relatively short time ago, knowledge management was often limited to individual police agencies and even individual law enforcement officers (United States Department of Justice, 1999). As law enforcement inter-agency information sharing systems become available and expand, the management of the collective organizational knowledge is critical and has high potential value for investigators. Now, more than ever, there is a need to manage the knowledge in order to exploit the information and to ensure we know what we know.

The events of 9/11 highlighted the problems with the lack of national inter-agency law enforcement information sharing. In the 9/11 case, we did not know what we knew, as there had been numerous police contacts with several of the hijackers (Markle Foundation, 2002; Reynolds et al., 2006). These events specifically provided renewed focus and funding to accelerate and prioritize information sharing projects (Budinger & Smith, 2011; Reveron, 2007). In addition, the recent paradigm of intelligence-led policing has expanded on the importance of law enforcement data and information from various law enforcement sources and agencies (McGarrell, Freilich, & Chermak, 2007; Ratcliffe, 2002 & 2003).

The FINDER information system is an example of a knowledge management system that provides law enforcement investigators with crucial information from a variety of inter-jurisdictional sources. A full definition of knowledge management will be provided in this section. In this study, the information that is available to law enforcement investigators that utilize and participate in the FINDER system, and those knowledge elements that assist in investigative success is examined. An explanatory model is developed to provide researchers and practitioners a better understanding of the impact of law enforcement information sharing on

investigations, primarily the success of investigations. The examination goes beyond a simple analysis of system use and user characteristics.

The study's primary conceptual framework involves the diffusion of innovations and knowledge management. Diffusion, as noted by Rogers (2003), can be described as a type of social exchange in which a change occurs within a social system. In regards to the diffusion of innovations, Rogers (1976; 2003) notes that there are four primary elements: "(1) the innovation, defined as an idea, practice, or object perceived as new by an individual or other relevant unit of adoption, (2) which is communicated through certain channels (3) over time (4) among the members of a social system" (p. 292).

Although the model of diffusion of innovations can be applied to various fields, this model provides the framework that inter-agency information sharing has been accepted in Florida. This proposition is supported by the literature and the large number of agencies that are participating. Since the FINDER technology has diffused throughout multiple law enforcement agencies, the information and knowledge gained from the various agencies becomes available to other law enforcement agencies and investigators for case solvability purposes.   The majority of this information was not previously electronically available in near real-time for most agencies before the terrorist attacks of 9/11 (Budinger & Smith, 2011; Reveron, 2007; Rogers, 2003).

The electronic access to multi-agency knowledge has the potential to positively impact the outcome of criminal investigations. This diffusion and increase of knowledge now sets the stage for the second component of the framework: knowledge management (The Center for Law Enforcement Technology, Training, & Research, 2011).

As the innovation of information sharing is diffused within the social system of law enforcement, new knowledge becomes available throughout the law enforcement community. One of the reasons the knowledge had not been previously available is due to the reluctance of law enforcement agencies to share information with one another (Geoghegan, 2007; Reynolds et al., 2006). Such reluctance to share information occurs for a variety of reasons. These range from security and technological challenges, cost, agency resource limitations, to the agency's hesitancy to surrender control of their information (Bureau of Justice Assistance, 2002; Geoghegan, 2007; Mitchell, 2008; Reynolds et al., 2006). As a result of diffusion and knowledge management, investigators now have new knowledge based resources to apply to investigations, thereby enhancing investigative efficacy and success.

Knowledge management can be considered a result of the combination of management science and information science (Zhao & Ordonez de Pablos, 2001). Similar to the diffusion of innovations, knowledge management encompasses various disciplines (Newman & Conrad, 1999), and the field of law enforcement is no exception. The notion of knowledge management can be considered an important and critical aspect in policing (Gottschalk, 2007; 2008).

As noted by Gottschalk (2006) knowledge management "…is concerned with simplifying and improving the process of sharing, distributing, creating, capturing and understanding knowledge" (p. 381). He notes that there are four stages when it comes to knowledge management technology (p. 623):

1. End-user-tools / people-to-technology: information technology provides people with tools that improve personal efficiency;

2. Who-knows-what systems / person-to-person: people use information technology to find other knowledge workers;

3. What-they-know systems / person-to-information: information technology provides people with access to information that is typically stored in documents; and,

4. How-they-think systems / person-to-system: system is intended to help solve a knowledge problem.

Knowledge management provides the ability to share specialized and beneficial knowledge to multiple members within the organization (United States Department of Justice, 1999). In regards to the FINDER information sharing system, information that is obtained by one law enforcement agency is now available to others that participate in the system. This new form of knowledge management can in turn be utilized for investigative purposes. This represents a community of knowledge and without information sharing one cannot access the large repository of geo-graphically distributed knowledge.

<center>Intelligence-Led Policing</center>

Compared to other theories and philosophies within the law enforcement field, the paradigm of intelligence-led policing is fairly new to the United States (McGarrell et al., 2007). The concept of intelligence-led policing focuses on certain concepts and elements; such as collaboration, information sharing, analysis, and intelligence operations in an effort to reduce crime (Ratcliffe, 2003; Scheider, Chapman, & Schapiro, 2009; United States Department of Justice, 2009).

There are several components within law enforcement that must be addressed in order to develop an intelligence-led policing philosophy:

- Blending intelligence and problem-oriented policing;

- Building stronger police-community partnerships;

- Blending strategic intelligence and police planning;

- Instituting information-sharing policies; and,

- Building analytic support for police agencies (United States Department of Justice, 2005).

The component of instituting information-sharing policies is a critical component and a priority post 9/11. The FINDER system that is examined in this study is a viable method for law enforcement agencies in Florida to share such information among one another.

The first stage of the intelligence-led policing model requires the agency's intelligence unit to analyze and understand the features of the crime environment. This interpretation is reliant upon the information received from various sources. This information is then gathered and provided to agency decision makers for tactical and strategic planning as well as policy development. The final stage and component of this paradigm is to take the intelligence analysis and apply that to crime reduction programs (Ratcliffe, 2003).

Intelligence-led policing has an emphasis on nurturing and promoting partners in an effort to create an information sharing environment (Scheider et al., 2009). In this study, the impact of information sharing on improving investigative success is the central theme and the results will be helpful to more fully understand the efficacy of intelligence-led policing.

Study Methodology

The study examines the following questions*:*

- Is there specific information that the FINDER law enforcement information sharing system provides that leads to case solvability? And if so, what type of information?

- Does the use of the FINDER law enforcement information sharing system contribute to investigative success?

The primary focus of this research is to examine investigative success derived from the use of information sharing system. Prior to the development and distribution of a questionnaire to Florida FINDER and non-FINDER system participants, it was crucial to determine the specifics of investigative success and its relation to case solvability. Along with a literature review, subject matter experts serving as criminal investigators were consulted to discuss the concept of success within investigations. An investigator can obtain investigative success without necessarily solving a criminal case. Investigative success can include such information that leads to the resolution of a case, information that leads to the location of a witness, victim, and/or suspect, recovering a stolen vehicle, stolen property, or obtaining additional information that furthers the investigation.

Participants selected for this study were law enforcement investigators from Florida county sheriff's offices and municipal police departments. Participants were categorized into two populations in this study: 1) law enforcement investigators who have access to FINDER, 2) and those law enforcement investigators who do not have access to FINDER. A comprehensive list of those agencies that participate in the FINDER information sharing system, as well as a list of all of the sheriff's offices and police departments in Florida was obtained. The appropriate

questionnaires were distributed to 404 investigators for each of the two population groups as noted above.

Summary and Organization of Following Chapters

This introductory chapter has provided a brief overview of law enforcement information sharing and how the events of 9/11 have impacted and influenced this topic. Although research has been conducted on law enforcement information sharing systems, the research is limited and focuses primarily on user acceptance (Chen et al., 2002; Chen et al., 2003) rather than on the effectiveness of outcomes and investigative success.

Chapter 2 is a detailed literature review on the events of 9/11 and the impact of the events on policies pertaining to law enforcement information sharing. Further, a review of various law enforcement information sharing systems that have been implemented is discussed, as well as several studies of these systems. The conceptual framework that is the foundation of this study is also outlined in Chapter 2. As stated previously, the primary frameworks include the diffusion of innovations model and knowledge management. In addition, the concept of Intelligence-led Policing (ILP) is discussed and how these theories combine to impact ILP and the law enforcement information sharing process, as well as a brief synopsis to the open systems theory.

Chapter 3 discusses the methodology used in this study and the rationale. Information regarding the research questions and hypotheses, the subjects studied, and the development and implementation of the survey instrument will be addressed and discussed in greater detail below.

The two remaining chapters, Chapter 4 and Chapter 5, will provide information regarding the data analysis and the questionnaire results. Chapter 5 addresses any limitations of the study, as

well as policy and future research recommendations. The results provide new information related to the factors associated with investigative success, information about the efficacy of information sharing systems, and information policy related areas.

CHAPTER 2: LITERATURE REVIEW

Introduction

The relevant literature provides guidance related to law enforcement information sharing. The impact and influence of the 9/11 events on the development and expansion of information sharing is examined here. Although the practice of law enforcement information sharing is expanding and gaining more attention, there is little empirical research that provides state-of-the-art knowledge about any of the public safety benefits from this innovation.

Second, this chapter describes the conceptual paradigms that are used in this research and provides an organizational framework demonstrating the notion of information sharing within law enforcement organizations. Several of the concepts include the open systems theory, the diffusion of innovations model, knowledge management, and the intelligence-led policing philosophy. As this study focuses on law enforcement information sharing and the impact on investigative success, this chapter concludes with a discussion pertaining to the notion of investigative success utilizing a grounded theory foundation.

Open systems theory (Scott & Davis, 2007) is used to provide insight and a framework to explain how the necessary infrastructure emerged to facilitate law enforcement information sharing. Open systems theory is utilized primarily to add an evolutionary context to the study. It serves as a pre-curser to the additional notions of the diffusion of innovations and knowledge management.

The diffusion of innovations model and knowledge management concept are introduced based on the notion that the innovation and diffusion of information sharing within the law

enforcement community provides additional knowledge to the law enforcement investigators. This new form of community, or collective knowledge, provided through the law enforcement information sharing system equips investigators with another tool to achieve increased levels of investigative success that is required to increase public safety. The intelligence-led policing philosophy is presented in this study to demonstrate how these concepts and models lead to a practical framework for law enforcement officials. Finally, this chapter concludes with an in-depth discussion of success within investigations and how it is related to the more common term of case solvability.

<div align="center">Law Enforcement Information & Intelligence</div>

Law enforcement information sharing has been reformed in response to a number of external and internal influences. Such influences include the notion that offenders are mobile and do not remain in one jurisdiction (Chen et al., 2002), the events of 9/11 and its subsequent Commission findings, as well as the need and desire to increase investigative success with increased communication and minimal barriers (Marks & Sun, 2007; Williams et al., 2009).

In this section the concepts of both law enforcement information sharing and criminal intelligence will be discussed. It should be noted that the two terms are not synonymous and encompass different definitions and meanings; however, the concepts can be linked to one another in the law enforcement field as outlined through the concept of intelligence-led policing. This process begins with the collection of data, which in turn is used to produce information and knowledge. This knowledge influences decisions and methods on how to prevent future criminal activity and/or solve past criminal activity becomes intelligence (Lambert, 2010; Ratcliffe, 2002;

Ratcliffe, 2003). The concept of intelligence-led policing will be discussed further in this chapter.

The re-ordering and reconfiguring of the nation's intelligence community is one of the most significant national security reforms pertaining to the intelligence community since the *1947 National Security Act* (Colby, 2007), which created the Central Intelligence Agency (CIA) (Chambliss, 2005). Throughout history, the involvement and focus of law enforcement intelligence has often been impacted by various events, such as the Civil Rights Movement, the economy, and wars (Carter, 2005).

An interest in law enforcement information sharing and intelligence is not a new one; however, the topic re-emerged after the 9/11 terrorist attacks as a critical need. Early law enforcement intelligence employed the "dossier system" (Carter, 2005), which is defined as a "collection of documents about some person or matter" (Webster's New World Dictionary, 1995, p. 179). In essence, the information collected was not specific in nature, but rather general information that was kept and relied upon for potential future use (Carter, 2005).

Law enforcement agencies have traditionally been reluctant to share their information with other law enforcement entities (Geoghegan, 2007; Reynolds et al., 2006). The reluctance of agencies to take advantage of information sharing, and the failure of information sharing projects, comes from several facets. These relate to concern over compromising security, technological expertise and challenges, agency resource limitations, organizational effort, cost, resistance to change, cooperation, and the hesitation or unwillingness of law enforcement agencies to essentially surrender control over their information (Bureau of Justice Assistance, 2002; Geoghegan, 2007; Mitchell, 2008; Reynolds et al., 2006). If agencies realized the benefits

that could be obtained by participating in information sharing, the potential for detecting and

preventing criminal activity could increase public safety.

In addition to the previous barriers, many law enforcement agencies have captured and stored

their data in proprietary and idiosyncratic records management systems that may not be

compatible with other law enforcement record management systems (Chen et al., 2002;

Geoghan, 2007; Hauck & Chen, 1999; Mitchell, 2008; Reynolds et al., 2006). Although data

availability has increased among law enforcement agencies (Chen et al., 2003), there still remain

obstacles that impede the potential optimum utilization of law enforcement data.

<u>Impact of 9/11 on Information Sharing</u>

Mohammed Atta was stopped by a Delray Beach, Florida police officer for speeding several

months prior to 9/11. The officer was unaware that Atta had an outstanding bench warrant for

failure to appear for a prior traffic violation in the adjacent county. The Delray Beach officer ran

Atta through the Florida and FBI criminal history databases and did not find any information

related to the outstanding arrest warrant. This "low-level" information is not stored in the state

or FBI systems. A discussion pertaining to "low-level" information will be discussed further in

this section. The lack of access to this type of information is an example of a failure to "connect-

the-dots" or obtain inter-jurisdictional information. Mohammed Atta, was the leader of the 9/11

terrorist "planes" operation (Reynolds et al., 2006).

The 9/11 terrorist attacks impacted the law enforcement community (Marks & Sun, 2007) and

efforts have been made within governmental agencies to modernize the collection and analysis of

intelligence information (Chen et al., 2003). It has been noted and documented that the lessons

learned from the 9/11 terrorist attacks was the failure of the United States intelligence community to "connect the dots" (Reveron, 2007) and such events essentially sparked the momentum of reform within the intelligence community (Chambliss, 2005; Colby, 2007). This notion of "connecting the dots" within the intelligence community and sharing information has now become a national priority (Reveron, 2007).

The *National Commission on Terrorist Attacks Upon the United States*, also known as the *9/11 Commission Report* (National Commission on Terrorist Attacks Upon the United States, 2004), was formed after the 2001 terrorist attacks on the United States (Geoghan, 2007). The Commission was formed "…to assess the government's preparedness for and response to the attacks and recommend strategies to guard against future acts of terrorism" (Geoghan, 2007, p. 65). The Commission released their report in 2004, which contained recommendations to reform the "intelligence community," including the creation of the *National Intelligence Reform and Terrorism Prevention Act of 2004* (Colby, 2007).   In its findings, the *9/11 Commission* determined that "…the biggest impediment to a greater likelihood of connecting the dots was the resistance of information sharing" (United States Senate Committee on Governmental Affairs, 2004, p. 3).

The *National Intelligence Reform and Terrorism Prevention Act of 2004* was signed on December 17, 2004 (Administration of George W. Bush, 2004) and called for the creation of an information system approach that not only processes, analyzes, and shares information among the three levels of government (national, state, and local), but also connects existing systems through a distributed design (Geoghegan, 2007; Reynolds et al., 2006; United States Senate Committee on Governmental Affairs, 2004).   The act noted that the lack of information sharing

between agencies was a "…key contributor to the tragedy" (Geoghegan, 2007, p. 65). While signing the *National Intelligence Reform and Terrorism Prevention Act of 2004*, former President George W. Bush noted that a crucial lesson that the United States learned from the 9/11 terrorist attacks was that the intelligence community must work together (Administration of George W. Bush, 2004).

Although this recent act has addressed issues related to information sharing, this is not the first time the federal government has attempted to improve and expand communication among law enforcement agencies. In 1967, the *President's Commission on Law Enforcement and the Administration of Justice* was formed to examine public safety in the United States (Feucht & Zedlewski, 2007). This commission gathered data, analyzed statistics, and focused on the concepts of science and technology to solve criminal justice related issues (Feucht & Zedlewski, 2007).

The *1967 President's Commission on Law Enforcement and Administration of Justice* released their report, *The Challenge of Crime in a Free Society*, eighteen months after receiving the mandate from former President Johnson (Feucht & Zedlewski, 2007). The Commission stressed the need for police improvement regarding various components, such as "…promote greater integration among the various government agencies that loosely comprise the criminal justice system" (Scott, 2009, p. 173). However, several decades later, the law enforcement community is still mostly unconnected (Reynolds et al., 2006).

The *National Intelligence Reform and Terrorism Prevention Act of 2004* created the Office of Director of National Intelligence (Colby, 2007; Reveron, 2007), who is appointed by the President of the United States with the consent of the Senate (Administration of George W.

Bush, 2004). The Office of Director of National Intelligence is an independent agency to

oversee the United States government intelligence (Reveron, 2007) and the Director of National

Intelligence will serve as the primary advisor to the President in regards to intelligence matters

and has the authority to "…order collection of new intelligence, ensure sharing of information,

and establish common standards" (Administration of George W. Bush, 2004, p. 2986). In

addition, the Director of National Intelligence will oversee budget and personnel issues over the

entire intelligence community, as the CIA is no longer the head of intelligence (Chambliss, 2005;

Colby, 2007). The Office of Director of National Intelligence was tasked with the following

duties: "…to integrate U.S. intelligence, bring depth and accuracy to analysis, and ensure

resources to generate future capabilities" (Reveron, 2007, p. 140).

Former President George W. Bush noted that the *National Intelligence Reform and Terrorism*

Prevention Act of 2004 was one of the "…most dramatic reform of our Nation's intelligence

capabilities since President Harry S. Truman signed the *National Security Act of 1947*"

(Administration of George W. Bush, 2004, p. 2985). Following the 2004 report from the *9/11*

Commission and the subsequent *2004 Intelligence Reform Act*, law enforcement information

sharing has become a top priority (Chen et al., 2003; Geoghegan, 2007; Marks & Sun, 2007;

Mitchell, 2008; Reynolds et al., 2006; Reveron, 2007; Williams et al., 2009).

In a statement to the Senate Committee on Homeland Security & Governmental Affairs in

October 2011, Zoe Baird Budinger and Jeffrey H. Smith of the Markle Foundation noted that

changes have occurred in respect to the government's use of information and information

technology; however, there are still recommendations for the future. Positive changes that have

occurred include the notion that information sharing among law enforcement agencies, as well as

the private sector has increased, although it has been slower in some areas and has lacked the appropriate guidance and oversight in others. In addition, it was also noted that information is becoming less decentralized. Recommendations for the future include the following:

- Strong leadership from the highest levels of government is required to sustain the progress made since 9/11 and drive our government to continue evolving to confront emerging 21st century challenges.

- People with a valid mission must be able to discover that relevant information exists and access it under an authorized use standard.

- As new and more powerful ways of sharing information are developed, both privacy and security protections must be increased simultaneously in order to keep pace.

- Information sharing is a tool that can help make the entire government more efficient. (Budinger & Smith, 2011, p. 7).

The FINDER System: An Example of a Trusted Law Enforcement Information Sharing Network

Automated law enforcement data sharing systems can be separated into three categories: national/regional, statewide, and local, and what Scott (2006) has termed as low level incident data. The low level data represents the immense amount of data collected primarily by local (city and county) law enforcement officials, such as information on suspects, vehicles, incident reports, calls for service, pawn shop transactions, field interviews, etc. (Reynolds et al., 2006). The majority of the low level data is not collected or available through existing national or statewide information systems. Scott (2006) found that about three percent of all police incident records are contained in national systems such as the FBI National Crime Information Center.

The Florida Integrated Network for Data Exchange and Retrieval (FINDER) is a system

designed to provide access to all incident records that contain the low level information like the

Atta warrant for failure to appear as previously described. Low level data is critical to support

and facilitate investigations (Scott, 2006).

The Florida Integrated Network for Data Exchange and Retrieval system (FINDER), which

became operational in 2002 (Geoghegan, 2007; Reynolds et al., 2006), is one information

sharing system that has tied together law enforcement agencies across the state. The system was

developed in partnership between the University of Central Florida's Public Safety Technology

Center and the grassroots practitioner based Florida Law Enforcement Data Sharing Consortium

(LEDSC) (Reynolds et al., 2006). In essence, FINDER "…allows police chiefs and sheriffs

throughout the state to electronically monitor information regarding suspects, suspicious

vehicles, and stolen property" (Geoghegan, 2007, p. 65).

The LEDSC was formed in 2000 and consisted of sheriff's offices and police departments

throughout Florida (Geoghan, 2007; Reynolds et al., 2006). This grassroots, self-governing

organization came to fruition when the sheriffs from Orange County (Orlando, Fl.) and

Hillsborough County (Tampa, Fl.) wanted to investigate property crime offenders who were

traveling the I-4 corridor in Central Florida and in essence wanted to "electronically link" the

stolen property reports to pawn shop transactions and share the information amongst one another.

As work and development on this data sharing system began to take shape in 2000, the terrorist

attacks of 9/11 enhanced the completion and growth of the system (Reynolds et al., 2006).

The consortium received start-up financial assistance from the University of Central Florida

(UCF) and the Orange County Sheriff's Office, and subsequently developed a distributed

federated architectural system known as FINDER (Reynolds et al., 2006). In using a distributed architecture, the LEDSC's goal was to alleviate some of the organizational obstacles that were previously mentioned. In addition, the LEDSC is consistent with the recommendations made by the *9/11 Commission*, the National Intelligence Reform and Terrorism Prevention Act of 2004, and the Markle Foundation.

Two years later, during 2002, FINDER became operational and allowed law enforcement agencies electronic access to low-level information that could now be obtained within minutes versus days, weeks, or not at all, as was typical prior to real-time inter-agency information sharing (Geoghan, 2007; Reynolds et al., 2006). Such information that was now accessible through the system included, but not limited to, information on suspects, witnesses, pawn shop transactions, vehicle information and stops, field interviews, incident reports, and evidence information. The data is only accessible by law enforcement officials and does not include non-law enforcement information (Reynolds et al., 2006).

The system uses Microsoft's Visual Basic.Net and SQL Server technology and incorporates the Global Justice XML Data Model, which ensures that all participating law enforcement agencies have the capability to share their information and data with one another (Reynolds et al., 2006). Through the Office of Justice Programs (OJP), the Global Justice XML Data Model

"…is an XML standard designed specifically for criminal justice information exchanges, providing law enforcement, public safety agencies, prosecutors, public defenders, and the judicial branch with a tool to effectively share data and information in a timely manner" and "…removes the burden from agencies to independently create exchange standards" (National Institute of Justice, 2010).

FINDER is accessible to those law enforcement agencies in Florida that host a FINDER system node. A request for information is sent to all FINDER system nodes within the network. These nodes, which allow various law enforcement agencies to access information, respond and the original node compiles the results and presents the information to the user (Geoghan, 2007). In essence, the record management systems by each law enforcement agency are linked to a FINDER node that stores the agency data and has the ability to generate a system query and respond to query as well. After a query is initiated by an authorized agency, the results are returned in real time via a secure law enforcement intranet known as CJNet. The Florida Department of Law Enforcement maintains the intranet (Reynolds, et al., 2006).

The FINDER system does not utilize a central warehouse, but rather the data shared through the system is retained and controlled by each participating agency (Geoghan, 2007; Reynolds et al., 2006). If an agency decides to stop participating in the system, their information is no longer available to the other participating agencies; however, this does not affect the availability of other participating agency's data. In addition, since there is no central data warehouse, there is in essence no central point for a virus attack or hardware failure that could impact the entire system and participating law enforcement agencies. Regardless of the software utilized by each individual law enforcement agency, or the format of the data, the FINDER system electronically translates the various record management systems into a common Global Justice XML format that is designed to standardize and facilitate automated data sharing. An important component in regards to FINDER is that all the data remains secure within each individual law enforcement agency as the data is not "co-mingled" into one database (Reynolds et al., 2006).

To determine how often the system is accessed by users, daily FINDER node logs related to each participating agency can be downloaded. The logs record user frequency and agency origination (Geoghan, 2007; Reynolds et al., 2006). Although the system has a "success tag" reporting tool that users are encouraged to utilize, it is not mandatory. Therefore the actual level of user successes (information that leads to arrests, new cases, recovered property, location of witness, etc.) has to be determined by other methodologies. As Reynolds et al. (2006) notes, the FINDER model could be a guide for future automated sharing of law enforcement data. However, it is difficult to empirically demonstrate the total added value of the system and its effectiveness towards investigative success.

In his study of 1,352 users of FINDER, Scott (2006) noted that sharing low-level information produced gains in individual performance and efficiency. Specifically, Scott (2006) reported that 71.6% of the 402 FINDER users that responded to the questionnaire reported that FINDER "helped improve their job performance" (p. 204) and 82.6% attributed FINDER to gains in their efficiency. Additionally, those law enforcement individuals assigned to investigative functions were most likely to report user-level success. His research studied the factors that influenced user-level success (Scott, 2006). This study will build upon Scott's research to more fully understand how law enforcement investigators that utilize FINDER data achieve the outcomes of investigative success.

Law Enforcement Information Sharing Systems & Related Research

Law enforcement professionals are the predominate users of computerized search capabilities in local government (Northrop, Kraemer & King, 1995). In return, computer use within law

enforcement and the need for accurate and timely information is crucial. Examples of common

search inquiries by officers are license plates, warrants, stolen vehicles, identification, criminal

histories, etc. Northrop et al. (1995) conducted a study on the uses and effects of computers by

law enforcement officials, specifically searches for information. The study discovered that

"computers allow them to be more effective in their work and that they may not be able to

function as effectively without them" (p. 264). The analysis focused on computerized search

capability and whether the search function is valued by law enforcement officials in their "fight

against crime." In addition to saving time, computer search use has permitted law enforcement

officials to obtain additional information more accurately, easier, and in larger quantities

(Northrop et al., 1995).

Agencies and organizations have, and are continuing, to develop information sharing systems

to expand communication between law enforcement agencies. However, currently no method or

system is available to access the various record management systems across the United States

(Mitchell, 2008). Information systems that have been developed include, but are not limited to,

the Multi-State Antiterrorism Information Exchange (MATRIX) (Krouse, 2004; United States

Department of Homeland Security, 2006), COPLINK (Chen et al., 2002; Chen et al., 2003), the

Arkansas Integrated Justice Information Systems (AIJIS) (Arkansas IJIS Office, 2002), and the

Regional Information Sharing Systems (RISS) (Bureau Justice Assistance, 2004). Although these

systems may only provide specific benefits for certain agencies, the premise is to open the lines

of communication between agencies to enhance public safety.

The Multi-State Antiterrorism Information Exchange (MATRIX) was a pilot project

developed out of a series of meetings (United States Department of Homeland Security, 2006).

In 2002, MATRIX, which included the states of California, Florida, Georgia, Kentucky, Louisiana, Michigan, New York, Ohio, Oregon, Pennsylvania, South Carolina, Texas, and Utah, was developed (United States Department of Homeland Security, 2006). Funding for the project was acquired in 2002 and 2003 and was derived through grants from the Department of Justice Bureau of Justice Assistance for $4 million and the Department of Homeland Security Office of Domestic Preparedness for $8 million (Krouse, 2004; United States Department of Homeland Security, 2006).

The MATRIX pilot project was "a collaborative information sharing effort involving public, private, and non-profit entities" (United States Department of Homeland Security, 2006, p. 1) and was administered by the Institute for Intergovernmental Research for the Department of Homeland Security (United States Department of Homeland Security, 2006); however, the security and access to MATRIX was overseen by the Florida Department of Law Enforcement (FDLE) (Krouse, 2004).

Law enforcement information that was available through the system included criminal history, sexual offender data, driver's license information, motor vehicle information, and department of corrections information (Krouse, 2004). In addition to the law enforcement data supplied through MATRIX, the system also provided public data and records that included, but was not limited to, aircraft pilot licenses, aircraft and property ownership, corporate filings, bankruptcy filings, and professional licenses. Information excluded from the system included such data as telemarketing and direct mailing lists, airline reservations or travel records, magazine subscriptions, credit card or debit card numbers, mortgage or car payments, marriage licenses, divorce decrees, birth certificates, and bank account information (Krouse, 2004).

Privacy concerns arose from the American Civil Liberties Union (ACLU) regarding the

storage and quality of the data, the expectation of privacy, and the potential for profiling based

on the data (Krouse, 2004). This in turn discouraged further participation by some states and in

the end, federal funding for the MATRIX pilot project was discontinued (Krouse, 2004).

Although FDLE terminated MATRIX in April 2005, the agency labeled MATRIX a success

(Reynolds et al., 2006).

COPLINK is an information sharing system that was developed at the University of Arizona's

Artificial Intelligence Lab in collaboration with the Tucson Police Department and Phoenix

Police Department and formally deployed in spring 2001 (Chen et al., 2002; Chen et al., 2003).

COPLINK provides an infrastructure for information sharing among various law enforcement

agencies. The issues of accessing numerous database systems to gather information through one

user interface was addressed (Chen et al., 2002). Several articles have been written about

COPLINK regarding the system's usability, usefulness, and the system itself (Chen et al., 2002;

Chen et al., 2003; Hauck & Chen, 1999). In a study utilizing survey and interview data, the

analysis supports the conclusion that the use of COPLINK Connect "improved performance over

use of the current RMS system" (Chen et al., 2002, p. 276).

On a national level, the FBI has developed the Law Enforcement National Data Exchange

(N-DEx); a criminal justice information sharing system. The goal of N-DEx is to utilize all

criminal justice data and transform the information into knowledge for all criminal justice

entities. Such criminal justice data includes incident/case information, booking, arrest, and

incarceration information, as well as probation and parole data. The data was implemented in

three phases, beginning in March 2008 with the case report, arrest, and investigative data. Phase

two was employed in July 2009 with the integration of booking and incarceration information. The third and final phase included probation and parole data and was deployed in April 2011. Although there is no fee for participating agencies, agencies may incur various expenses in order to ensure their data meets the standard to the N-DEx Information Exchange Package Documentation (IEPD), as well as with additional upgrades to hardware or software. There are currently over 200,000 users (FBI N-DEX, 2013).

In addition to information sharing systems within law enforcement and criminal justice agencies, public safety networks, otherwise known as PSNs, have the goal of increasing information and communication. It is noted by Williams et al. (2009) that PSNs, are inter-agency collaborations that are "…focused on the development and use of information and communication technologies (ICT) to support the information sharing and functional interoperability needs of public safety organizations engaged in law enforcement, criminal justice, and emergency response" (p. 13). Public safety networks can vary from one geographic location to the next, including their infrastructure and purpose (Williams et al., 2009).

Examples of PSNs include the Automated Region Justice Information System (ARJIS), which has become a collaborative regional partnership among law enforcement agencies in the San Diego region; the Pennsylvania Justice Network (JNET) that provides assistance to various criminal justice agencies throughout the state; and Chicago's CLEAR system, which serves the entire state of Illinois, even though it was originally developed to assist the city of Chicago's Police Department (Ashley, 2006; Williams et al., 2009).

Although PSNs encompass a broader classification of public safety agencies other than solely the law enforcement entities, PSNs carry the same type of momentum and interest in data sharing

and agency collaboration as the technological information sharing systems that exist in the law enforcement community.

Zaworski (2004) conducted a study to look at whether the Automated Region Justice Information System (ARJIS) impacted the performance of law enforcement officers. In the study, the San Diego Sheriff's Office, who utilized and participated in ARJIS, was compared to the Broward County Sheriff's Office. In his research, it was concluded that San Diego officers perceived the automated computing as playing a greater role in enhancing their individual productivity. However, there was no significant difference between the two agencies in terms of their assessment of the role that automated computing played in providing information that directly resulted in an arrest.

Zaworski's (2004) study, along with Scott's (2006), sets the foundation for this study and the objective of learning more about the impact that FINDER has had on the performance of those that utilize the system, i.e. case solvability. Zaworski (2004) recommended that future research on the topic of information sharing and law enforcement performance should continue, so as to further study other types of law enforcement information sharing systems and whether they share a link to performance. He further recommended that such future studies should rely less on self-reporting and more on quantifiable performance measures in an attempt to strengthen the link between utilizing law enforcement information sharing systems and productivity.

As noted above, the Citizen and Law Enforcement Analysis and Reporting (CLEAR) project is one public safety network that is utilized by the Chicago Police Department. CLEAR is an information technology system that allows the Chicago Police Department to share crime information (Ashley, 2006). A status report, conducted by the Chicago Community Policing

Evaluation Consortium, noted that some of the benefits of the system included more efficient deployment of personnel, increased clearance of crimes, and more efficient case processing of suspects. In examining police use of and attitudes towards CLEAR, researchers noted that a "majority of the officers were using the automated systems available to them" (Ashley, 2006, p. 2).

Williams et al. (2009) conducted a study on public safety networks and the notion as to why PSNs form in certain geographical locations and the reasons for such formations. Due to the lack of research on the topic of public safety networks, this study contributed to initial empirical and conceptual insights pertaining to the location and formation of PSNs. Through their study, the researchers noted that PSNs, and the level of these systems, is complex and is based on variety of factors that are economic, social, and political (Williams et al., 2009). Their study concluded that population and crime rates are indicators of "needs" for public safety networks and that predicting the formation of public safety networks is difficult due in part to the lack of complete and usable data (Williams et al., 2009). In addition, the study noted that PSNs are more "frequently located in highly populated areas and those with high violent crime rates" (Williams et al., 2009, p. 21).

In designing a system that is efficient and meets the needs of agencies in regards to sharing pertinent information, the system needs to be one in which data can be collected, stored, and retrieved with ease. This is critical because agencies do not typically store their data in exactly the same format and structure (Chen et al., 2002). In addition, systems need to be cost-effective, user friendly, and demonstrate that voluntary participation will be worthwhile (Geoghan, 2007).

In 2002, the Bureau of Justice Assistance released *Mission Possible: Strong Governance Structures for the Integration of Justice Information Systems.* Through survey participation, five themes were discovered in relation to establishing the structures that can facilitate in the integration of justice information systems. The themes are as follows (Bureau of Justice Assistance, 2002, p. 2):

- Ensure equal involvement/participation from all agencies/jurisdictions involved;

- Explore and secure funding;

- Set realistic goals and objectives with a reasonable timeframe for the plan;

- Keep on-going, open lines of communications with all agencies/jurisdictions involved; and,

- Have unconditional support of county boards/city councils/elected officials.

Although the systems and analysis tools utilized by several agencies (as listed above) are promising, the problem with the various systems discussed is that there is currently little empirical research to validate system effectiveness. According to the Bureau of Justice Assistance, Center for Program Evaluation and Performance Measurement (2010), information sharing and integration initiatives is still a "relatively new area of study" (p. 1) and many of the studies conducted on the topic have revolved around the implementation of the proposed system (see for example Arkansas IJIS, 2002; Bureau of Justice Assistance, 2004; Chen et al., 2003) as well as the usability of such information sharing networks (see for example Chen et al., 2002; Hauck & Chen, 1999). In many situations the system's effectiveness of solving cases and preventing crime has not been fully explored and an increased effort in evaluating the goals of the systems is needed (Bureau of Justice Assistance, 2010).

In January 2012, the United States Department of Justice (DOJ), Office of Justice Programs (OJP) and the National Institute of Justice (NIJ) announced that it was sponsoring research to be conducted on policing, specifically "policing to improve criminal investigative processes and promote police integrity in law enforcement agencies at the State and local levels" (National Institute of Justice, 2012). In the request for proposal, the NIJ has noted that it anticipates that up to $1 million may be awarded through this proposal (National Institute of Justice, 2012).

Although several studies have provided information on the elements of the criminal investigative process, there has been limited research on factors that can influence the outcome of such investigations (Chaiken, Greenwood, & Petersilia, 1976; Horvath, Meesig, & Hyeock, 2001). One such study, conducted by Horvath et al. (2001), surveyed 1,746 law enforcement agencies for the purpose of describing current law enforcement methods pertaining to police practices, policies, goals, and perspectives related to the law enforcement investigative process. One category of questions specifically dealt with investigative effectiveness, in which three factors were seen as necessary to enhance agency clearance rates. These three factors included personnel, investigative training, and technology (Horvath et al., 2001).

As noted above, the primary points of interest for the recent NIJ research proposal include the criminal investigative process and police integrity. In regards to the criminal investigative process, the request for proposal denotes that the study should include factors that can influence the process, such as the type of organization and composition, use of patrol officers, training and selection criteria of investigators, supervision, use of support personnel, and the definition of an effective investigation. This NIJ research proposal lends support to this dissertation's significance pertaining to criminal investigations, its processes, and the results of investigations.

In conclusion, agencies and organizations continue to develop various law enforcement information sharing systems. As these systems continue to be developed and examined, the research has primarily focused on the user acceptance of the systems by investigators, as well as the implementation of the system. There has been little empirical research pertaining to the effectiveness of the system, specifically as they relate to information sharing and investigative success.

<p style="text-align:center">Conceptual Framework</p>

Crime is complex, a challenge, and difficult to fully explain its various dimensions (Lilly, Cullen, Ball, 2002). Aside from crime itself, the criminal justice system as a whole is multifaceted, as there are many factors and entities involved. These include the criminal behavior displayed by the perpetrators, an agency's organizational structure and policies, interactions between the various law enforcement agencies, courts, and the correctional system.

Theories and theoretical frameworks help to explain and address the intricate nature of the criminal justice system and its many components. Theories can be defined as a "…proposed explanation or description of some phenomenon…" (Bickman & Rog, 2009, p. 436). In the field of criminal justice and criminology, there are numerous theories to help explain and provide an understanding to criminal behavior, recidivism, how law enforcement agencies can combat crime, and society's role in crime.

An examination of the open systems theory provides insight and a framework to explain how the necessary infrastructure emerged to facilitate information sharing in the field of law enforcement. Here, the theory is used only for this purpose and primarily to add an evolutionary

context to the work. It is a necessary pre-curser to the conceptual framework of diffusion of innovations and knowledge management in relation to information sharing. The intelligence-led policing philosophy demonstrates the framework of these two theories. Since the concept of this study is that the information and knowledge gained from law enforcement information sharing impacts investigative success, this section concludes with a discussion of the concept. Due to the limited research, this study takes a grounded theory approach to frame the notion of investigative success and how information sharing impacts investigative success. As will be outlined in the following sections, the general grounded theory for this study is that as knowledge and information becomes available to law enforcement agencies via inter-agency information sharing, investigative success, specifically case solvability will be positively impacted.

Open Systems Theory

This theory is important to provide a contextual understanding of the impact of 9/11 on information sharing in America. Organizations are prevalent throughout society and the criminal justice system is no exception. Changes within the law enforcement field, including the interest and expansion of information sharing, have come about in part due to the events of September 11, 2001, and such changes can be supported by the theory/model of organizational development (Marks & Sun, 2007). According to Burke and Litwin (1992), "…organizational change stems more from environmental impact than from any other factor" (p. 529). The changes that occur within an organization can be complex, as numerous variables play a role.

These changes and the results of such changes can at times be difficult to predict and control, as environmental factors and the potential for resistance can hinder potential outcomes and

benefits. Burke and Litwin (1992) have proposed a model of causes of organizational performance and change as a need to understand how organizations function and then how these same organizations may deliberately change. In their model, the authors utilize the open systems theory as a framework with input-throughput-output and feedback loop as a premise, and develop the causal aspect from practice.

In a study conducted by Marks and Sun (2007) on the impact of the 9/11 terrorist events on organizational development among state and local law enforcement agencies; the authors note that there is evidence to suggest that the boundaries of law enforcement agencies has changed. In particular, the study observed that although there was some change noted in the internal organizational structure of such agencies, more frequent change has occurred in regards to the level of organizational boundaries. Due to the events of 9/11, procedural as well as structural changes have occurred within law enforcement agencies at all levels and as such, relationships have been impacted. In particular the interaction between federal and local law enforcement agencies, local law enforcement agencies amongst one another, and law enforcement and communities (Marks & Sun, 2007).

The study examined articles published in *The Police Chief: The Professional Voice of Law Enforcement* and *Sheriff Magazine* between 1999 and 2004, with a total of 108 magazines. The study notes that "one of the most common forms of collaboration discussed has been the development of regional information sharing networks" (Marks & Sun, 2007, p. 167). The necessity for information sharing and utilizing such existing networks was discussed in more than 30 articles in both magazines.

The notion of an agency being an open system with other law enforcement agencies and the passage of data and information amongst the various law enforcement agencies, could in the end allow these agencies to achieve a greater level of success and productivity. Information sharing and more specifically, voluntary and cooperative information sharing, permeates the boundaries that once left law enforcement agencies to their own devices. Technological advances within the law enforcement field and its environment have allowed for the process to change and as such, the law enforcement field has begun to adapt to such information sharing advances.

The criminal justice system, including the field of law enforcement, can be noted as an open system. A change in one component, whether due to political, environmental, or social influences, can impact other such components of the system (Marks & Sun, 2007). An open organizational system places lesser emphasis on structure and gives more weight and importance on process and interdependent activities, which can be tightly connected or loosely joined. A crucial concept of the open systems theory is its acknowledgment that the environment not only forms and supports the organization but permeates the organization itself. There is the recognition that external elements can impact the participants of the organization more than the internal elements themselves.

Along with the external elements that can impact a participant and their behavior, it is also important to note that these same participants have multiple allegiances and characteristics aside from the job and organization itself. As stated by Scott and Davis (2007), open system organizations "are not closed systems, sealed off from their environments, but are open to and dependent on flows of personnel, resources, and information from outside" and stress the "importance of cultural-cognitive elements in the construction of organizations" (p. 31).

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Boundaries are an important aspect in organizations; however, for the open organizational system, boundaries can be difficult and subjective and even though a participant may not be enclosed within the boundaries of the organization, certain behaviors and actions that they exhibit may indeed be enclosed within those boundaries. Boundaries within the open system are permeable and are influenced by the environment, often through a process of feedback loops, which focuses on inputs, throughputs, and outputs (Scott & Davis, 2007). As stated earlier, the open system focuses more on the process and interdependent activities of the organization.

In conclusion, the open systems theory underscores the environmental impact of 9/11 and is an explanation of how and why agencies that previously maintained a closed posture to other agencies changed. Whereas there had been some philosophical movements within agencies to embrace a more open model for information change, the movements were isolated and not widely accepted. The results of 9/11 created major new organizational restructuring and policy changes that permeated various levels of law enforcement in America.

<u>Diffusion of Innovations Model</u>

The origins of the diffusion of innovations paradigm are two-fold and can be traced to (1) the German-Austrian and British schools of anthropology and (2) the French sociologist Gabriel Tarde (Rogers, 1976). However, it wasn't until the early 1940s, when Bryce Ryan and Neal Gross, two sociologists, presented a "revolutionary paradigm" of diffusion research. Their research focused on the diffusion of hybrid seed corn among Iowa farmers, an important innovation in Midwestern agriculture (Rogers, 1976, p. 290). This new "revolutionary

paradigm" provided the basic framework for the diffusion model and set the stage for additional research; which has attracted the attention of scholars within various academic fields.

Early diffusion studies focused on the agricultural aspect of the diffusion of innovations model; however, Rogers (2004) has since researched and explored this paradigm in an effort to generalize and apply to various fields of study. The study of diffusion of innovations has increased dramatically over the years, with approximately 250 publications pertaining to the subject each year in a wide array of scholarly journals (Rogers, 2004). The field of criminal justice and the policies and actions of those within the law enforcement field is included in this scope of studies and journals.

What exactly is diffusion or the diffusion of innovations model? As noted by Rogers (1976; 2003), diffusion and the primary elements of the model include: "(1) the innovation, defined as an idea, practice, or object perceived as new by an individual or other relevant unit of adoption, (2) which is communicated through certain channels (3) over time (4) among the members of a social system" (p. 292). In essence, Rogers (2003) notes that diffusion is a special type of communication in which the messages are related to new ideas and innovation. Rogers (2003) describes communication as "a process in which participants create and share information with one another in order to reach a mutual understanding" (p. 5). Aside from the notion that diffusion is a special type of communication, (Rogers, 2003) he also describes diffusion as a type of social exchange, in which "alteration occurs in the structure and function of a social system" (p. 6). In conclusion, a social exchange occurs when these new ideas and innovations are diffused into their respective arena, then the ideas are either adopted or rejected, which leads to certain results (Rogers, 2003). As a side note, Rogers (2003) notes that diffusion, for purposes of

this model, pertain to not only the spread of planned ideas but also those ideas and innovation that are unplanned and unstructured.

As stated previously, there are four main elements in the diffusion of innovations model: (1) an innovation (2) is communicated through certain channels (3) over time (4) among the members of a social system (Rogers, 1976; 2003). Innovation, a primary element to this model, is described by Rogers (2003) as "an idea, practice, or object that is perceived as new by an individual or other unit of adoption" (p. 12). The newness refers to the development, persuasion, or acceptance. It is noted that there are five main attributes of innovations that predict the rates of adoption: relative advantage, compatibility, complexity, observability, and trialability (Makse & Volden, 2001; Rogers, 2003). Their definitions as provide by Rogers (2003) are provided below:

1. Relative Advantage: "the degree to which an innovation is perceived as better than the idea it supersedes" (p. 15)

2. Compatibility: "the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters" (p. 15)

3. Complexity: "the degree to which an innovation is perceived as difficult to understand and use" (p. 16)

4. Observability: "the degree to which the results of an innovation are visible to others" (p. 16)

5. Trialability: "the degree to which an innovation may be experimented with on a limited basis" (p. 16)

In terms of the element of communication, specifically the channels of communication, this refers to the method in which messages get from one individual to another; i.e. mass media channels, interpersonal channels, etc. (Rogers, 2003).

Time, the third element, is involved in the diffusion process in three ways (Rogers, 2003, p. 20).

1. "the innovation-decision process by which an individual passes from first knowledge of an innovation through its adoption or rejection" This includes the five main steps of knowledge, persuasion, decision, implementation, and confirmation.

2. "the innovativeness of an individual or other unit of adoption compared with other members of a system" The adopter, member of social system based on innovativeness, can be categorized into the following categories: innovators, early adopters, early majority, late majority, and laggards.

3. "an innovation's rate of adoption in a system, usually measured as the number of members of the system who adopt the innovation in a given time period" Innovation research typically has an S shape; indicating that in the early period, few adopt the innovation and later, once those initial users of the innovation have demonstrated it, it becomes mainstream. Later, the line will typically flatten out, indicating a lag in the remaining members to join and utilize the innovation (Skogan & Hartnett, 2005). "The success of innovations can be judged by how quickly it moves to the take-off point at which it begins to enter the mainstream, by how long the mainstream process takes, and by ultimate percentage of potential adopters who choose to get involved" (Skogan & Hartnett, 2005, p. 402).

The fourth and final element of diffusion is that of the social system, which Rogers (2003) defined as "a set of interrelated units that are engaged in joint problem solving to accomplish a common goal" (p. 23). This social system can include individuals, informal groups, organizations, and/or subsystems and consists of formal, as well as informal structures (Rogers, 2003). The rate at which diffusion occurs can be impacted by the social system, specifically by the system norms, opinion leaders, and change-agents, as well as who determines to adopt the innovation (Rogers, 2003).

As noted previously, the model of diffusion of innovations crosses various fields, including law enforcement. Several studies have occurred that have explored the notion of diffusion of innovations in several aspects of the law enforcement field. One study conducted by Skogan & Hartnett (2005) examined the diffusion of information technology innovation among municipal police departments in northeastern Illinois. In this situation, the Chicago Police Department decided to open access to their centralized data warehouse to these municipalities. The study examined the elements associated with the adoption of the innovation and the degree to which the innovation was utilized by the various municipalities. Such elements included: criminal histories, outstanding warrants, traffic violation convictions, status of juveniles, vehicle thefts, etc. The study noted that the decision to adopt the system was influenced by the agency's involvement in networks, their experience in using a law enforcement database, and the human capital capacities of the various law enforcement organizations; while the level of utilization was influenced by the organizational resources and the experience of using the system. The study also concluded that the growth of the utilization of the system was due to three factors: "the active role played by the 'evangelist' representing the host department; the fact that access to the

system was free; and because it primarily empowered detective" (Skogan & Hartnett, 2005, p. 401).

Diffusion of innovations provides the framework that inter-agency information sharing has occurred in Florida based on the literature discussed and the number of agencies that are participating. The premise of the diffusion of innovations has been recognized within the social system, i.e. the law enforcement field and community. Since this diffusion has been ensued, the information and hence knowledge gained from the various agencies becomes available to other law enforcement agencies and investigators for investigative success purposes that was previously not available; especially before the terrorist attacks of 9/11.

In terms of this study, the model is that the innovation of the information sharing technology of the FINDER system has spread within the law enforcement community. This has in turn been adopted by various agencies within Florida and has led to increased knowledge that benefits investigations. The diffusion of innovations framework sets the stage for the paradigm of knowledge management, which will be discussed in the next section, as well as its impact on the notion of investigative success.

Knowledge Management

The previous section provided insight and an explanation into the diffusion of innovations model and its relation to law enforcement and specifically law enforcement investigators and investigative success. The other piece of this framework relates to knowledge management and how the diffusion of the information sharing technology has been diffused within certain areas of the law enforcement field. These events and innovations have led to the availability of new

knowledge sources for investigators. As an innovation is diffused into a social system, new knowledge can be obtained that previously was not available. As a result of knowledge management, investigators have new tools to solve cases (Gottschalk, 2006).

Prior to the discussion of the knowledge management, the definition of knowledge and the various types of knowledge that exist will be discussed. Knowledge can be defined as "information possessed in the mind of individuals: it is personalized information (which may or may not be new, unique, useful, or accurate) related to facts, procedures, concepts, interpretations, ideas, observations, and judgments" (Alavi & Leidner, 2001, p. 109). Alavi and Leidner (2001) note that "information is converted to knowledge once it is processed in the mind of individuals and knowledge becomes information once it is articulated and presented in the form of text, graphics, words, or other symbolic forms" (p. 109).

Knowledge management can be considered a result of the combination of management science and information science (Zhao & Ordonez de Pablos, 2001) and does not encompass only one single discipline, but rather is a compilation of several fields of study (Newman & Conrad, 1999). "Knowledge management as a field of study is concerned with simplifying and improving the process of sharing, distributing, creating, capturing and understanding knowledge" (Gottschalk, 2006, p. 381). Based on this definition, knowledge management is relevant in the field of law enforcement, especially with the recent focus on information sharing. Another definition of knowledge management includes the following: "Knowledge management is a discipline that seeks to improve the performance of individuals and organizations by maintaining and leveraging the present and future value of knowledge assets. Knowledge management systems encompass both human and automated activities and their associated artifacts"

(Newman & Conrad, 1999, p. 2).   In addition, a primary result of knowledge management is the creation of knowledge (Gore & Gore, 1999).

A fundamental task of knowledge management is the transformation of tacit knowledge into explicit knowledge or the transformation of information into organizational action (Goodridge, 2001; United States Department of Justice, 1999). Tacit knowledge consists of mental models, beliefs, and perspectives, which can be difficult for one to articulate but can also represent expertise (Nonaka, 1999), whereas explicit knowledge can include a set of policies and procedures, documented facts, etc.   In essence, the notion of knowledge management is having the ability to share specialized knowledge when others within an organization are in need of such information (United States Department of Justice, 1999).

The public sector is turning to the idea of knowledge management as they now face competition for funding, as well as increasing expectations from the public (Gottschalk, 2006). The field of law enforcement is no exception and knowledge management can be considered an important and critical aspect in policing (Gottschalk, 2007; Gottschalk, 2008). Although there is an increasing amount of data available among the law enforcement community, many challenges continue to plague how the data is obtained and used to increase knowledge and information (Chen et al., 2003, p. 28). Some of these challenges were discussed previously and pertain to individualized record management systems, systems that are incompatible with one another, etc. As Gottschalk (2006) notes, police investigations are concerned with the following: "(1) the apprehension of criminals by the gathering of evidence leading to their arrest and (2) the collection and presentation of evidence and testimony for the purpose of obtaining convictions" (p. 381). Investigations conducted by law enforcement can often be divided into two areas: those

initial activities conducted by patrol officers who may respond initially to a scene and collect basic information and then those follow-up activities conducted by trained law enforcement investigators who are part of an investigative unit (Gottschalk, 2006).

In a study conducted by Michael R. Pendleton (United States Department of Justice, 1999), knowledge management and the extent of the idea within the police profession as it related to problem solving was examined. Although the study found that police professionals were not aware of the concept of knowledge management and its meaning; once it was explained, these same individuals were able to identify various efforts in which knowledge management was applied in their agency. It was found that once knowledge management was more fully explained, and the potential impacts that the concept could have on problem solving efforts, the participants began to delve more into the notion and how knowledge management could work in their own law enforcement entity. In the end, this study provided a foundation that knowledge management is occurring within the law enforcement field and its participants are more involved in collaborative activities than previously suspected (United States Department of Justice, 1999).

In another example of the study of knowledge management within law enforcement, the Redlands Police Department was reviewed pertaining to their incorporation of knowledge management as a police knowledge management innovator (United States Department of Justice, 1999). Specifically, the study looked into how the concept of knowledge management was applied to the street level police problems that agencies across the country face. The results from the study suggest that an innovator in law enforcement is not limited to innovative individuals, but rather in organizations where the innovation occurs (United States Department of Justice, 1999).

In another study, the researcher explored how police investigation performance and knowledge management systems influenced one another (Gottschalk, 2006). Aside from the law enforcement duties of emergency response, community policing, crime prevention, etc. (Gottschalk, 2006); an important component of law enforcement involves investigations and solving cases. Gottschalk (2006) notes that there are four stages when it comes to knowledge management technology (p. 623):

1. End-user-tools / people-to-technology: information technology provides people with tools that improve personal efficiency;

2. Who-knows-what systems / person-to-person: people use information technology to find other knowledge workers;

3. What-they-know systems / person-to-information: information technology provides people with access to information that is typically stored in documents; and,

4. How-they-think systems / person-to-system: system is intended to help solve a knowledge problem.

Pendleton and Chavez (United States Department of Justice, 1999) outlined twelve guidelines for adopting and implementing knowledge management "as an organizational development and management strategy for innovation in a police organization" (p. 79). The guidelines are presented as a five part purposeful organizational strategy focused on Pendleton's (2002) model that not only identifies, but also connects the introduction and implementation of innovation through knowledge management. This model consists of: "A.) Creating an Environment for Organizational Innovation; B.) Capturing Knowledge and Knowing What we Know; C.) Packaging Knowledge and Sharing What we Know; D.) Applying Knowledge and Using What

We Know; and E.) Creating Knowledge and Increasing What We Know" (United States Department of Justice, 1999, p. 82). The twelve guidelines include the following (United States Department of Justice, 1999):

1. Formally adopt and promote an organizational mission and values that facilitate knowledge management;

2. Practice and promote innovation leadership that is centered on knowledge management;

3. Re-structure the police department to facilitate knowledge management;

4. Conduct a knowledge inventory and establish a knowledge repository;

5. Understand, promote and accommodate the protocols for accessing data and knowledge;

6. Structure police knowledge into policy, organizational and tactical packages to promote meaning and use;

7. Create routine knowledge sharing process not events;

8. Use knowledge management packages and processes to select applications;

9. Avoid using knowledge management to police the police;

10. Use knowledge management to select and design interventions and solutions;

11. Establish specific programs and protocols for learning from organizational experience; and,

12. Establish a specific research and development program.

To achieve knowledge management at the organizational level, there is a method that must be employed in order to obtain the common knowledge that was not previously known by others within the organization. The information that is obtained by one law enforcement agency is now available to others that participate in the FINDER system, due to the diffusion of the FINDER

system technology. This system has allowed agency level data and information to be shared among other law enforcement agencies, thus creating a new form of knowledge management for the law enforcement field that can be used for investigative success purposes.

There is a growing component of knowledge management, which focuses on regional knowledge management (Zhao & Ordonez de Pablos, 2011). According to Zhao & Ordonez de Pablos (2011), the premise of regional knowledge management is to focus the knowledge innovation and development management at the regional level, which can be utilized as a resource to "promote the innovation, spillover, circulation and proliferation of knowledge, and increase the regional competitiveness to reach the maximum level of benefits" (p. 39).   There are three elements to knowledge management: knowledge innovation management, knowledge diffusion management, and basis environment establishment; however, for regional knowledge management, the primary mission is to "establish regional innovation environment, and manage regional knowledge innovation and knowledge diffusion by using management tools, and enhance the regional competitiveness and cooperative power through the development of regional innovation system" (Zhao, 2006; Zhao, 2007; Zhao, 2010; Zhao & Ordonez de Pablos, 2001, p. 41).

In relation to the FINDER system, regional management could include certain geographical areas of Florida such as the I4 corridor, or the entire state of Florida. Regional knowledge management is a newer topic and one that continues to be studied and developed (Zhao & Ordonez de Pablos, 2011).

Intelligence-Led Policing

Law enforcement entities continuously evaluate their policies and procedures and are often responding to the pressures of external factors, such as the terrorist events of 9/11 (McGarrell et al., 2007). Just as efforts in information sharing are hindered due to a lack of training, budgets, jurisdictional policies and procedures, etc.; the same is true for intelligence operations. To address such obstacles, changes are needed in the way law enforcement agencies gather, assess, and redistribute information (United States Department of Justice, 2005). The philosophy of intelligence-led policing is a recent paradigm to the United States compared to other policing paradigms, such as community oriented policing, and is a method of responding to such obstacles (McGarrell et al., 2007). This section will provide an example of how the models previously discussed provide a framework for a practical philosophy in law enforcement and how information sharing can lead to investigative success.

The 9/11 terrorist attacks brought to light the need to enhance information sharing, U.S. intelligence, and essentially the attitude and conduct of modern policing; as well as the changes to be made not just at the federal level but also the state and local law enforcement levels (Carter & Carter, 2009). Improving U.S. intelligence not only impacts homeland security efforts but also efforts to combat those conventional crimes that local law enforcement officials encounter; as both of these are not mutually exclusive (United States Department of Justice, 2005). The paradigm of intelligence-led policing enticed law enforcement to adopt a new method of policing and investigating (Ratcliffe, 2002). In order to develop intelligence-led policing, several areas are to be addressed (United States Department of Justice, 2005): blending intelligence and problem-oriented policing, building stronger police-community partnerships, blending strategic

intelligence and police planning, instituting information-sharing policies, and building analytic support for police agencies.

The fourth component, instituting information-sharing policies, has become an important element in law enforcement. In instituting information-sharing policies, intelligence can be developed, which can lead to the potential possibility of combating criminal activity and solving cases. The FINDER system is one mechanism for law enforcement agencies to share information amongst one another.

Although there is no universally accepted definition for intelligence-led policing (Carter & Carter, 2009), many of the definitions provided embody similar concepts and elements. The following are several definitions of intelligence-led policing provided by various entities.

" …collaborative law enforcement approach combining problem-solving policing, information sharing, and police accountability, with enhanced intelligence operations" (United States Department of Justice, 2009, p. 1).

"Intelligence-led policing is the application of criminal intelligence analysis as an objective decision-making tool in order to facilitate crime reduction and prevention through effective-policing strategies and external partnership projects drawn from an evidential base" (Ratcliffe, 2003, p. 3).

"Intelligence-led policing is a collaborative enterprise based on improved intelligence operations and community-oriented policing and problem solving" (United States Department of Justice, 2005, p. vii).

"Intelligence-led policing emphasizes the need to systematically gather information from patrol officers and other sources and then to analyze this information in order to turn it into

actionable intelligence to, in the ideal case, proactively prevent crime and terrorism:

(Scheider et al., 2009, p. 709).

As demonstrated above, there is no universal definition of intelligence-led policing that exists and there are differing views pertaining to not only a concrete definition and implementation. However, there is a movement in law enforcement towards the adoption of the intelligence-led policing framework (Carter and Carter, 2009).

The International Association of Chiefs of Police (2002) noted that intelligence-led policing "aids law enforcement agencies in identifying threats and developing responses to prevent those threats from reaching fruition in America's communities." Although the United States has been placing additional emphasis on intelligence since 9/11, the roots of intelligence-led policing can be found overseas; primarily involving two reports that focused on British policing: *Helping with Enquiries – Tackling Crime Effectively* and *Her Majesty's Inspectorate of Constabulary* (Carter & Carter, 2009; Ratcliffe, 2002).

The term "intelligence-led policing," originally called the Kent Policing Model, has its roots in Great Britain and the concept was developed by the Kent Constabulary in response to a dramatic increase in burglaries and auto thefts (Scheider et al., 2009; United States Department of Justice, 2005). This was occurring simultaneously when budgets in the law enforcement field were being reduced. In response to the situation, law enforcement officials focused their energy and time on intelligence related to the property offenses that were occurring and redirected less serious calls for service to other law enforcement agencies. It was reported that over the next 3 years, a 24% decrease in crime occurred (United States Department of Justice, 2005). This

model has become the foundation for the United Kingdom's National Intelligence Model (Scheider et al., 2009).

In the 1990s, the British government began implementing a business-plan philosophy for all elements of government, including policing (Ratcliffe, 2002). This initiative was two-fold; either begin applying the business model to government or privatize portions of the government (Carter & Carter, 2009). The two reports, as mentioned above, focused on information gathering and analytical components of policing in today's society. During this time, the National Criminal Intelligence Service (NCIS), which was formally known as the drugs intelligence services, was formed and the goal expanded to deal with all forms of organized crime and not just the sole purpose of drugs. In 2000, the British National Intelligence Model (NIM) was initially released and formally adopted in 2002 by the British Association of Chief Police Officers (APCO). This business process model was employed to combat crime. The adoption of the NIM signified the transition of traditional intelligence processes to intelligence-led policing (Carter & Carter, 2009).

Historically, a majority of law enforcement agencies in the United States did not have the intelligence capacity or training on an intelligence process; as this was viewed to be held by larger agencies (Carter & Carter, 2009). Early law enforcement experiences to implement intelligence efforts were confronted with the hurdle of limited analysis and more so files of information on individuals based on intuition rather than empirical threats (Carter, 2005). These previous "intelligence" practices in the United States consisted of keeping such information on individuals who had not actually committed offenses, but were rather interpreted as engaging in activities that were unconventional. In the 1960s and 1970s many law enforcement agencies

were sued under federal civil rights legislation for such practices. Aside from such civil rights issues, the notion of intelligence was not well defined and those agencies that did employ analysts were often not well trained (Carter and Carter, 2009).

In March 2002, shortly after the 9/11 events, a summit was held that brought together over 120 criminal intelligence experts from across the United States (Carter & Carter, 2009; Ratcliffe, 2003). Individuals participating in the conference determined that a National Intelligence Plan was to be developed and concluded with a primary recommendation: "to promote intelligence-led policing through a common understanding of criminal intelligence and its usefulness" (International Association of Chiefs of Police, 2002, p. v). These actions further led the Global Justice Information Sharing Initiative (Global), which was a group funded by the Office of Justice Programs that was responsible for developing processes in relation to information sharing among criminal justice entities to develop a subgroup: the Global Intelligence Working Group (GIWG). This new subgroup was then tasked with the responsibility to implement the recommendations from the 2002 Summit, which resulted in the creation of the National Criminal Intelligence Sharing Plan (NCISP). In the end, national standards were developed and set, along with the recommendation for agencies to adopt the intelligence-led policing philosophy (Carter & Carter, 2009).

The model illustrated in Figure 1, depicts the intelligence-led policing paradigm. The first stage in this model is to interpret the criminal environment that faces the policing entity, which is typically conducted by an intelligence section or unit. This interpretation is reliant upon information received from a variety of different sources. The information and intelligence that is gathered is then passed on to those individuals who have the authority and ability make

decisions, as well as create policies and procedures that will ultimately impact the criminal environment. The third and final stage is for those individuals that have this ability, to take the intelligence that has been brought to their attention and apply such intelligence towards policies that will reduce crime and impact the criminal environment (Ratcliffe, 2003).
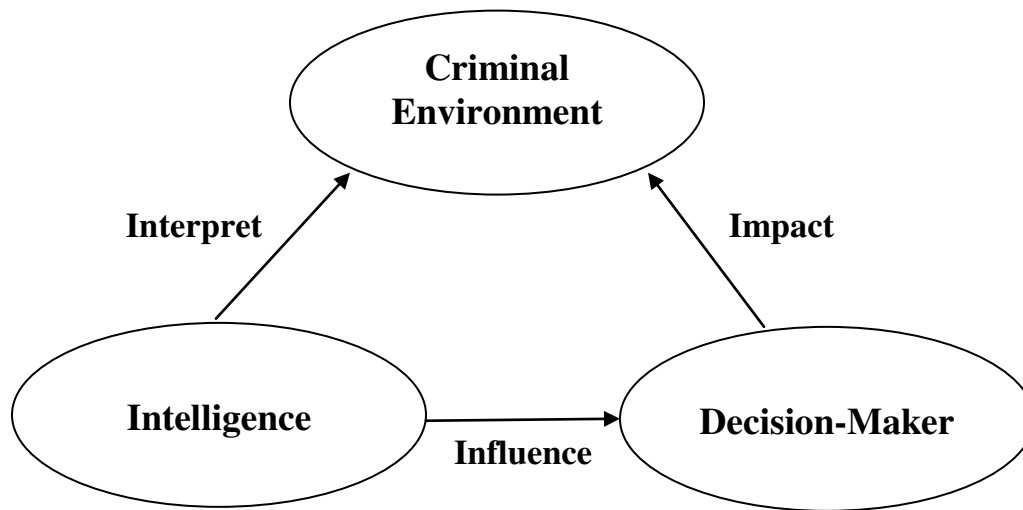
Figure 1: An Intelligence-Led Policing and Crime Reduction Process

Although the model above depicts a process, Ratcliffe & Guidetti (2008) note that the intelligence-led policing paradigm should be viewed as a philosophy to develop intelligence based processes. As noted by the National Criminal Intelligence Service (2000), the primary four elements of intelligence-led policing focus on the following: targeting offenders, management of crime, investigation of linked crimes / events, and application of preventative measures.

Lambert (2010), notes that the potential of intelligence-led policing "can guide operational policing activities toward high-frequency offenders, locations, or crimes to impact resource allocation decisions" (p. 2). This concept of intelligence-led policing has become an essential component of Fusion Centers, which are described as a "collaborative effort of two or more agencies that provide resources, expertise, and information to the center with the goal of maximizing their ability to detect, prevent, investigate, and respond to criminal and terrorist activity" (Lambert, 2010, p. 2). Fusion Centers provide an opportunity for information and intelligence to be exchanged between various law enforcement and public safety entities in an effort to not only combat terrorism, but also additional criminal activity (Lambert, 2010; McGarrell et al, 2007).

The application of the intelligence-led policing philosophy in the United States has not come without its challenges. In a report conducted by Scheider et al. (2009), the authors discuss some of the limitations and weaknesses pertaining to the intelligence-led policing model. Such weaknesses include that the model is limited in the following aspects: changes that affect the flow, analysis, and use of information; partnerships with federal and state public safety organizations for the collection, analysis and sharing of information/intelligence (partnerships element); to the use of intelligence to inform problem solving addressing terrorism and serious crimes (problem solving element); and to citizen privacy concerns pertaining to community relations and trust (p. 704).

Important foundations of intelligence-led policing include community policing and problem-solving policing. Community policing looked to reestablish the relationship between law enforcement officials and the community. Similar components of community policing and

intelligence-led policing include the following: "both are dependent on two-way communications with the public; both are dependent on analysis of information and the transformation of information to actionable intelligence; absent ethical decision making and a commitment to individual rights, both COP and ILP are likely to repeat mistakes that have resulted in significant setbacks for law enforcement (McGarrell et al., 2007, p. 144).

McGarrell et al. (2007) note that one of the biggest challenges to implementing the intelligence-led policing model is that the paradigm is conceptual and that it builds on the previously noted models: community policing, problem solving, and partnerships. Some may view the concept as one that is solely for combating terrorism or high rate offenders. Although several of the above mentioned paradigms have similar attributes they also vary. Community policing looks at a decentralized, geographic based structure; whereas intelligence-led policing includes more of a centralized format based on intelligence (McGarrell et al., 2007).

Albeit there is a lack of empirical research on the effectiveness and success of intelligence-led policing (Ratcliffe, 2002), as well as an accepted definition and implementation method (Carter & Carter, 2009), it is a philosophy that has permeated the law enforcement community. In regards to the connection between information sharing, intelligence, and other entities, agencies are pooling together information resources and in return maximizing such resources as time and investigative information (Lambert, 2010). This paradigm of intelligence-led policing focuses on utilizing information as a guide to strategic decisions pertaining to resources and implementation of operations. In essence, to solve cases and prevent crime, an intelligence-led paradigm needs to be applied and implemented. In order to create useful intelligence,

information and data must be collected. Sharing information among law enforcement entities

assists agencies in promoting intelligence.

The mentality within the law enforcement community needs to transform from one of a

traditional, our information remains within our agency; to one of transparency, inter-

jurisdictional communication and cooperation in which information can be shared, intelligence

gathered and disseminated to the end users.   This study focused on the information sharing

component (United States Department of Justice, 2005).

In order for intelligence-led policing to be functional and beneficial, it will call for

organizational change and one in which possible restructuring may occur. This has been fueled

by the terrorist events of 9/11 and further encouraged by a number of public policies by the

federal government. Due to the demands of such initiatives and actions, law enforcement entities

must revisit their own policies and procedures in order to reflect and align with this more recent

paradigm (Carter & Carter, 2009).   Another component to make ILP beneficial is that of a

multiunit, multiagency structure; meaning that the mentality must be incorporated throughout the

entire agency rather than solely based in one unit, i.e. crime analysis unit. Much of the

information comes from a variety of areas within the law enforcement agency that can be

transformed into meaningful intelligence: i.e. street patrol officers, detectives, various specialty

units, etc.

Intelligence-led policing has an emphasis on nurturing and promoting partnerships with other

law enforcement entities in an effort to create an information sharing environment (Scheider et

al., 2009). Increased demands on law enforcement entities build partnerships in an effort to

share intelligence and data (McGarrell et al., 2007). Again, this study and model focuses on the

participation of information sharing within the law enforcement community. Although this theory is intelligence-led policing, intelligence is not the same as information that is collected, but rather what is produced after information is collected and the data is evaluated and analyzed. This study lends a hand to intelligence-led policing as information sharing is a large and crucial component of intelligence-led policing; which can lead to investigative success.

<div align="center">Investigative Success</div>

The previous discussions regarding the conceptual framework for this study provides the foundation for the end result: investigative success. What is investigative success? As there is no definitive definition involving investigative success, the concept was developed using the grounded theory approach. Grounded theory is defined as a "type of inductive theory that is based (grounded) on field observation. The research makes observations in natural settings, then formulates a tentative theory that explains those observations" (Maxfield, 2001, p. 423). This study used grounded theory to create a functional and practical concept of law enforcement investigative success.

One could logically conceptualize that law enforcement information sharing systems are developed in an effort to assist in the collection and distribution of information, which could ultimately assist and further criminal investigations. When law enforcement officials investigate a case, they examine factors that may lead to improving the chances of solving the specific case. These factors, often coined case solvability factors, include but are not limited to, the following: existence of fingerprints, existence of a surveillance photo, whether a suspect is known by the victim, witnesses, traceable stolen property, physical evidence, suspect description, vehicle

description, method of operation, etc. (Anne Arundel County Maryland, 2008; City of Peoria, 2009; & Laurens County Law Enforcement Center, 2006).

Case solvability factors can be defined as "…facts and circumstances of a case that influence the likelihood that it might be solved…" (DNA Initiative, 2011) and solving a case is often determined by the number and extent of such factors (City of Peoria, 2011). When law enforcement officials discuss the notion of case screening, the process is often based on certain factors that are required to solve a case: case solvability factors (Anne Arundel County Police, 2011; Commission on Accreditation for Law Enforcement Agencies, 2010).

The Commission on Accreditation for Law Enforcement Agencies, Inc. (CALEA) is an accreditation program whose purpose is to "improve the delivery of public safety services, primarily: maintaining a body of standards, developed by public safety practitioners, covering a wide range of up-to-date public safety initiatives; establishing and administering an accreditation process; and recognizing professional excellence" (Commission on Accreditation for Law Enforcement Agencies, 2011). One particular standard, 42.1.2, discusses the notion of case solvability. The following is an excerpt from the standard set forth by CALEA:

> The objective of case screening is to assign available personnel to those investigations that have the best chance of being resolved. The written directive should specify how such screening is to be conducted, by whom, and what criteria (solvability factors) should be used. Screening of preliminary investigative information should assist in the decision on whether a follow-up investigation should be made.
> The decision about the extent of follow-up or the suspension of investigative efforts should be made at a management level. Adherence to this standard should provide law

enforcement administrators with improved management control over the productivity of
investigations. Decision-making involves the continued application of solvability and
degree-of-seriousness factors plus operational input from periodic reporting by
investigators on the progress of assigned cases. Suspension criteria may include lack of
further leads or solvability factors, unavailability of investigative resources, and/or
insufficient degree of seriousness. (Commission on Accreditation for Law Enforcement
Agencies, 2010).

Case solvability factors, and associating a weight and score to such factors, are important to
law enforcement investigations and are often discussed in agency procedures. For example, in
the City of Peoria Arizona Police Department Policy Manual (2009), the agency has a section on
solvability factors:

F. Solvability Factors (42.1.2)

1. Cases that have a total weight of solvability factors totaling 20 points or more will
be assigned for follow-up investigation. Those with less than a total of 20 points
will be assigned at the discretion of the CIS Sergeant.

2. All cases that are referred to the Criminal Investigations Section for evaluation and
assignment will be assessed by a CIS Sergeant to maintain consistency in the
solvability factors and assignment of cases for follow-up investigation. The
guidelines that are attached will be used for determining solvability factors of cases
and include the screening weights that will be used to determine which cases will be
assigned for follow-up investigation by officers and detectives.

Another example comes from the Anne Arundel (Maryland) County Police (2011) under Case

Screening System:

D. Case Screening System

Commanders will screen each case individually to determine whether or not the case will

be assigned to an investigator for further investigation. The objective of case screening is

to apply available manpower to those investigations that have the best chance of being

successful. Written criteria should specify how such screening is to be conducted, by

whom, and what criteria (solvability factors) should be used. Screening of preliminary

investigative information will assist in the decision on whether a follow-up investigation

will be made. Example so criteria include the availability of manpower, the degree of

seriousness, and other solvability factors, such as:

Is a suspect identified or described in detail?

Are there any witnesses available?

Vehicle tag numbers/descriptions?

Other crimes with similar modus operandi?

Physical evidence available?

Informant information?

When a crime occurs and law enforcement investigators examine the case, case screening

occurs. During the process of case screening, investigators review those case solvability factors

that are available in an effort to determine the course and the potential success of the

investigation.

Due to the limited literature review pertaining to the outcomes of information sharing, approximately a dozen subject matter experts were interviewed as to pertinent information that assists investigations. The subject matter experts ranged from a crime analyst to an agency head, from routine patrol deputies, to detectives. The interviews with law enforcement officials introduced situations in which there were certain "successes" of an investigation; however, they did not necessarily lead to an arrest or solving the case. Such "success" factors included information related to:

- recovered property

- identification of suspects

- locating persons

- recovered vehicles

- obtaining case leads

- field information report (FIR) information that aided a case

- information that provided a link to another criminal/crime

As stated previously, the literature review on law enforcement investigations, specifically pertaining to the success of a criminal investigation is sparse; as the concept it not defined and the closest notion includes that of case solvability. Case solvability can be considered a component of a larger framework of success that an investigator can obtain when investigating a criminal case. Through interviews and the literature review, it was determined that case solvability factors included the following:

- witness information

- associate information

- weapon information

- forensic information

- vehicle information

- similar modus operandi information

- demographic information

- address information

- past historical/background information

- additional information (i.e. phone numbers, etc.)

However, it is possible for a law enforcement investigator to have investigative success with a case but technically not case solvability. For this study, the term investigative success includes not only the traditional notions of solving a case or obtaining an arrest; but also the factors noted above.

Summary of Conceptual Framework

The various models and philosophies presented above are interlaced with one another. Law enforcement agencies exhibit characteristics of an open system by permitting the passage of data amongst one another. The innovation of the law enforcement information sharing technology of the FINDER system has spread within the law enforcement community and lends support to the diffusion of innovations. As the FINDER system has been diffused and adopted by various law enforcement agencies within Florida, there is an increase of the availability of extended knowledge for the investigator. An example of this knowledge and the notion of law

enforcement information sharing are portrayed in the intelligence-led policing philosophy. The

new knowledge gained by investigators from the information in FINDER can lead to

investigative success for law enforcement investigators. Figure 2 provides a flow of the various

conceptual frameworks presented and how they are related.

Open Systems Theory:
concept permits for the sharing
and passage of data

diffusion of law enforcement
information sharing system
between and within agencies

Knowledge Management is
created due to the diffusion
of information from internal
and external sources

new knowledge and sharing
of information from FINDER
assists in investigative success
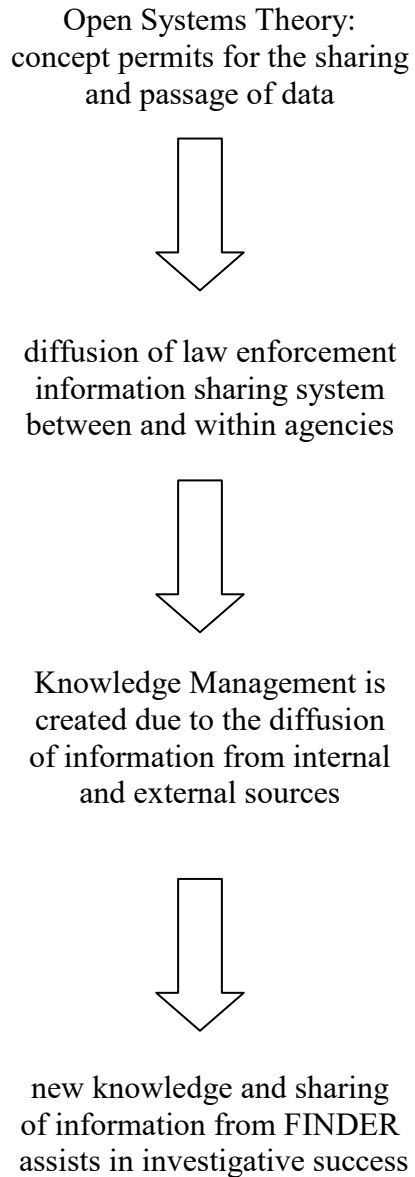
Figure 2: Flow of Conceptual Framework

In conclusion, information sharing among law enforcement entities is an important and crucial component in order to improve law enforcement effectiveness. As more emphasis is placed on information sharing among law enforcement agencies and information sharing systems expand, additional empirical research is necessary to determine the system's impact on effectiveness. The FINDER system has demonstrated user satisfaction and efficiency (Scott, 2006); however, the impact that the system has on criminal investigations has been left unanswered.   This study will explore this impact and the information contained in the system.

<u>Hypotheses</u>

This study provides two hypotheses and two propositions related to the law enforcement information systems and their relationship between case solvability and investigative success variables. The two hypotheses are presented below:

Ho1:   Certain categories of information provided by FINDER increases case solvability. These are:

      a.   Witness information

      b.   Associate information

      c.   Weapon information

      d.   Forensic information

      e.   Vehicle information

      f.   Modus Operandi information

      g.   Address information

h. *Suspect information*

i. *Victim information*

j. *Additional information*

Ho2: Certain investigative success factors provided in FINDER, present information that improves the chances for increased arrests. These are:

a. *Property recovered*

b. *Suspects identified*

c. *Persons located*

d. *Vehicles recovered*

e. *Case leads determined*

f. *FIR information*

g. *Information that is linked to another criminal/crime*

In addition to the two hypotheses, two propositions were formulated for this study. Propositions were formulated in this study due to the fact that participants from the non-FINDER group did not all utilize the same system. In addition, the non-FINDER systems have different features than FINDER and those specific features and capabilities of the systems were unknown. The lack of, and therefore internal validity issues could not be addressed. The propositions are as follows:

Proposition 1: Case solvability information for FINDER users is equal to case solvability information for non-FINDER users.

Proposition 2: Investigative success information for FINDER users is equal to investigative success information for non-FINDER users.

CHAPTER 3: METHODOLOGY

Introduction

This chapter is an overview of the study's research design and methodology that are utilized to answer the study's primary research questions. A description of the research design, sampling methodology, survey instrument and development, and data collection is included. The chapter concludes with an explanation of the analytical methods utilized for this study.

Research Questions

In a study, a research question serves the purpose of stating what the researcher wants to learn. In addition, the research question is the central framework used to guide the research in relation to hypotheses and the conceptual framework, and serves as a guide for managing the study (Maxwell, 2005). The primary research questions of this study include the following:

Is there specific information that the FINDER law enforcement information sharing system provides that leads to case solvability?

Does the use of the FINDER law enforcement information sharing system contribute to investigative success?

Unit of Analysis

As Bickman & Rog (2009) note, knowing the level, or unit of analysis, for a study is "typically determined by the level that the intervention is introduced" (p. 14) and is not only necessary for a study but also critical to answering the correct question. The unit of analysis

typically refers to the level that the researcher is studying: individuals, groups, objects, or events and can often be determined at the level that the intervention is introduced in the study. For this study, the unit of analysis is the individual law enforcement investigator.

Research Design

This study employs a mixed-methods research methodology. A mixed-methods research methodology can encompass the following characteristics:

- Focusing on research questions that call for real-life contextual understandings, multi-level perspectives, and cultural influences;

- Employing rigorous quantitative research assessing magnitude and frequency of constructs and rigorous qualitative research exploring the meaning and understanding of constructs;

- Utilizing multiple methods (e.g., intervention trials and in-depth interviews);

- Intentionally integrating or combining these methods to draw on the strengths of each; and,

- Framing the investigation within philosophical and theoretical positions (National Institutes of Health, 2013).

Researchers have noted the reasons for utilizing a mixed methods approach (Plano Clark, 2010):

- Enhance the meaning of a singular perspective

- Contextualize information

- Develop a complete understanding of the research problem

- Examine experiences and processes in conjunction with statistical measurement

The mixed-methods research methodology allows a researcher to draw and integrate various theoretical perspectives and combines components of both the qualitative and quantitative research designs, rather than keep the two methods separate. The notion is that by merging the two research methods, the researcher is able to maximize the strengths of each methodology, while minimizing the weaknesses. Qualitative research encompasses inductive driven research and focuses on experiences and understandings; whereas quantitative research incorporates deductive driven research and looks to examine relationships among variables utilizing numeric data (National Institutes of Health, 2013).

The mixed-methods research methodology should be utilized in situations in which the use of a solely qualitative approach or a quantitative approach is not adequate to complete a full understanding about a research problem. For this study, the notion of investigative success, case solvability, and the outcomes related to investigations was not clearly outlined in the literature. Therefore, the grounded theory approach was employed as subject matter experts were drawn upon to discuss case solvability and additional factors in which an investigator may experience success in an investigation but not technically solve the case. These subject matter experts assisted in the development of the theoretical framework that certain elements of multi-jurisdictional information sharing are related to increases in investigative success.

In utilizing a mixed-methods research approach, this study engaged in a sequential design. In a sequential design, the dataset from one design builds off the results of the other. For this study, the interviews from the qualitative approach were utilized to gain a quantitative follow-up through the use of statistical approaches and results.

Although this method of research attempts to draw on the strengths of both qualitative and quantitative research approaches, the mixed methods does offer some challenges. Such challenges to this methodology include the additional time and resources due to utilizing two research methods, sample sizes, and the analysis and interpretation of results (Creswell & Plano Clark, 2011; National Institutes of Health, 2013). These challenges and the steps taken to reduce such weaknesses will be discussed later in this chapter and the proceeding chapters.

The inability to randomly assign participants to either the experimental group or the control group is due to the fact that law enforcement entities make the determination if their agency will participate in the FINDER system or choose to utilize an alternative law enforcement information sharing system. Since there is no comprehensive list available that provides the names of law enforcement investigators that participate and do not participate in the FINDER system; the agencies determined which investigators would participate in the study and complete the questionnaire.

The groups consisted of investigators who have access to the FINDER system versus investigators who do not use the FINDER system. The survey instrument was provided to the corresponding local law enforcement agencies, completed by those law enforcement investigators chosen by their law enforcement agency, and returned by mail or through an on-line electronic survey. The development of the survey, participant participation, and data collection will be discussed in further detail throughout this chapter.

The time order of a study is an important component. This study will utilize a retrospective cross-sectional design in which the information gathered will be gathered at one point in time based on the responses from participants. The participants were asked to recall their past

experiences with using the FINDER system. For those participants that do not utilize the

FINDER system, they were asked to recall their past experiences with an information system that

they primarily utilize.

Due to the research approach of this study, threats to both internal and external validity are

present and it is an objective of the methodology to minimize these threats. These threats and the

measures taken to minimize the threats will be discussed below.

According to Cook & Campbell (1979), internal validity refers to the "approximate validity

with which we infer that a relationship between two variables is causal or that the absence of a

relationship implies the absence of cause" (p. 37).   There are several ways in which the internal

validity of a study can be threatened or jeopardized. The various types of threats to internal

validity that Cook and Campbell (1979) reference include: history maturation, testing,

instrumentation, statistical regression, selection, mortality, diffusion or imitation of treatments,

compensatory rivalry by respondents receiving less desirable treatments, and resentful

demoralization of respondents receiving less desirable treatments.

The threats of history, maturation, and mortality may impact the validity of the survey data in

regards to events and the passage of time between measurements. To reduce this threat, the

survey was administered over a relatively short time: approximately one month. In an additional

attempt to reduce the threat of history and events that could occur at the same time as the

treatment and impact the participant's behavior, the questionnaire specifically referenced

questions related to their past experience in regards to the information system that the participant

utilized. This study is relying on the recollection of past experiences of the participants and it is unknown if their recollection could potentially pose a threat; however, based on the topic of the study, this should not pose a substantial threat.

Testing can also impact the internal validity; however, the study did not include a second questionnaire, but rather only one questionnaire that was distributed at one point in time to the participants. This in turn reduced the threat as participants did not become accustomed to the questionnaire. An additional threat is that of instrumentation and any changes in the instrument, observers, or even scorers that can create various outcomes. This is a potential threat for this study; however, there were only two versions of the questionnaire. Each version asked the same types of questions pertaining to the participant's background and their information system; therefore, reducing any threat to validity. There was no scoring involved or observers and only one individual classified the data and entered the responses of the questionnaires.

As far as the threat of statistical regression, the researcher only inquired as to which agencies utilized the FINDER system and those that did not utilize the system. The agency determined which investigators would participate in the study. There was no pre-survey awareness of an investigator's attitude, experience, investigative success rate, clearance rate, use, or other characteristics pertaining to their involvement of the information system. As stated previously, participants were asked to complete only one questionnaire during one time period, as the study did not include both a pretest and a posttest.

In regards to diffusion or imitation of treatments, it is unlikely that the two groups communicated with one another during the course of completing the questionnaire, as participants only completed one questionnaire at one point in time. In this study, the treatment

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was the type of information system utilized and was pre-determined by the involvement of their agency. Participants could not change their treatment and once again, there would be no reason to infer that respondents collaborated with one another. As stated previously, and which can be a threat to internal validity, participants were not randomly assigned to either group and therefore the notion and threat of resentful demoralization of respondents receiving less desirable treatments should not impact the results of the study.

One threat that is present in this study is participant selection. According to Cook and Campbell (1979) selection threat occurs "when an effect may be due to the difference between the kinds of people in one experimental group as opposed to another" (p. 53). As stated previously, a primary component of this study focused on those law enforcement investigators that utilize the FINDER system and those law enforcement investigators that did not use the FINDER system. As the researcher was not able to randomly assign those investigators to a group, this could cause some validity issues as some agencies may want an investigator with the highest clearance rate to complete the questionnaire or their most motivated and proactive investigator to become a participant.

An additional threat is that of compensatory rivalry by respondents receiving less desirable treatments, otherwise known as the John Henry Effect. This occurs when those involved in the study, specifically the control group, are aware of the treatment and become competitive and may exert additional effort. This is not a threat for this study, as there was no compensation or potential preferred outcomes based on the participant's assignment. There was no advantage to either group in regards to their assignment and the decision was determined when the participant's law enforcement agency selected an information sharing system.

<u>External Validity</u>

In addition to internal validity, there are concerns with external validity. This concept is defined as "the approximate validity with which we can infer that the presumed causal relationship can be generalized to and across alternate measures of the cause and effect and across different types of person, settings, and times" (Cook & Campbell, 1979, p. 37). Those aspects that threaten the external validity of a study include population threat and ecological threat.

Population validity refers to how the participants in the study were selected; specifically if the participants were randomly selected or, if the participants were selected out of convenience. (Gliner & Morgan, 2000). Gliner and Morgan (2000) note that population validity should be evaluated and based on the following: representativeness of accessible population, adequacy of sampling method from accessible population, and adequacy of response or return rate. Here, population validity is an issue as random sampling was not plausible. In addition, the two groups, those that utilize the FINDER system and those that do not utilize the FINDER system, are not a representative sample. This is due to the fact that there is not a comprehensive list of what type of system an investigator utilizes but rather whether their agency is involved in the participation of the FINDER system. For those investigators that do not participate in the FINDER system, the system they utilize may vary from one agency to another and no two systems encompass the exact same information.

The second threat, ecological validity, denotes "whether the conditions, settings, times, testers, procedures, or combinations of these factors are representative of real life, and, thus, whether the results can be generalized to real-life outcomes" (Gliner & Morgan, 2000, p. 160).

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In addition, Gliner and Morgan (2000) note that there are five issues in reviewing the threat of ecological validity: naturalness or setting or conditions; adequacy of rapport with testers or observers; naturalness of procedures or tasks; appropriateness of timing and length of treatment; and extent to which results are restricted to a specific time in history. This study employed a self-administered questionnaire and therefore could not create the settings of conducting a law enforcement investigation. This study relied on the investigator noting their previous experience in utilizing an information system.

<u>Measurement Validity</u>

Measurement validity refers to how well an instrument (questionnaire) measures an intended construct for a given population. There are several types of measurement validity: face validity, content validity, criterion validity, and construct validity (Gliner & Morgan, 2000). Although face validity is mentioned, many researchers do not consider this to be a scientific type of measurement validity as an instrument is noted to have face validity if the content in the instrument appears to be appropriate (Gliner & Morgan, 2000). The additional types of measurement validity must be taken into consideration and are described below.

Content validity is specifically related as to whether the content in the instrument measures the concept that the researcher is attempting to measure. As for the content validity for this study, it should be suitable due to the fact that various parts of the questionnaire pertained to information obtained from the literature on case solvability. In addition, subject matter experts were interviewed on the topic of investigative success, as well as reviewed the questionnaires and provided feedback.

In terms of criterion validity, which refers to validating the instrument against some form of external criterion (Gliner & Morgan, 2000), this study explores the information sharing systems of FINDER in regards to investigative success. This study relies on the responses of participants based on their past experiences with the information system.

As for the final type of measurement validity, construct validity, is related to whether the scale is measuring what it is intended to measure (Gliner & Morgan, 2000). Although the questionnaire for this study was based off of literature reviews and interviews with subject matter experts, who also reviewed the questionnaires, there was no formally tested and adopted questionnaire pertaining to investigative success and information sharing. As stated previously, there is little empirical research on this topic. This potential threat will be discussed further in the final chapter: Conclusions & Recommendations.

Study Sample and Population

When conducting a research study, it is imperative that the researcher not only develops a sampling plan, but also implements the plan in such a manner to reduce bias to a minimum (Bickman & Rog, 2009). The terms that are often included in the discussion of sampling include: target population, sampling frame, selected sample, and the actual sample. The study's terms are defined accordingly (Gliner & Morgan, 2000). The target population, also referred to as a theoretical population, includes all of the interested participants/groups that the researcher wishes to generalize. The sampling frame, also known as the accessible population or survey population, consists of those individuals of the target population that the researcher is able to access; while the selected sample refers to those participants who are actually selected from the

larger sampling frame. The final term, actual sample, are those individuals who truly participate and complete the study and whose data is used in the final analysis.

As stated previously, the unit of analysis for this study was the individual law enforcement investigator. For this study, the target population was all law enforcement investigators who either participate in the FINDER system or participate in an alternate type of information system. In addition, the sampling frame and selected sample also consisted of Florida law enforcement investigators who either participated or did not participate in the FINDER information sharing system. As stated previously, there was not a comprehensive list of investigators for either group, but only a listing of the law enforcement agencies that participated in the FINDER system. As a result, the study relied upon the appropriate agencies (those that participated in the FINDER system and those that did not participate) to distribute the questionnaires to the law enforcement investigators. The sample size and results will be further discussed and evaluated in Chapter 5: Findings.

Data Sources

One important component of a questionnaire is to determine if there is a known opportunity for all members of the population to be included in the sample (Dillman, 1978). As Dillman (1978) notes, a study sample cannot be considered representative of the population, unless all representatives of that specific population have an equal chance of being in the sample. Participants selected for this study were law enforcement investigators from Florida county sheriff's offices and municipal police departments.

Participants were categorized into two populations in this study: 1) law enforcement investigators who have access to FINDER, 2) and those law enforcement investigators who do not have access to FINDER. For this study, the term law enforcement investigator refers specifically to investigators and does not include routine patrol or support personnel. A list of agencies using FINDER was obtained that was current as of November 14, 2011. A comprehensive list of the individual FINDER users was not available; however, at the time of the survey there were approximately 9,000 to 10,000 FINDER users (The Center for Law Enforcement Technology, Training, & Research, 2011). A list of all sheriffs' offices and police departments in Florida was obtained through the Florida Department of Law Enforcement (Florida Department of Law Enforcement, 2011).

Once those agencies that participate in the FINDER system were identified, a list was generated of those agencies that do not participate in the FINDER system and a sample size was determined for each category (FINDER users and non-FINDER users). The sample size was based on the desired confidence level and level of error, which will be discussed in further detail. It was then established that a selected number of questionnaires would be sent to each law enforcement agency based on their program participation. For those agencies that have access to FINDER, it was requested that four investigators within their agency complete the FINDER questionnaire and for those agencies that do not participate in the FINDER system, it was requested that two of their investigators complete the non-FINDER questionnaire. The reason for the difference was because more agencies do not use FINDER than do participate in information sharing system. At the time that the list was developed, it was determined that

approximately 101 local sheriff's offices and police departments utilized FINDER compared to 202 local agencies that did not use the system.

Sample Size

An important component of the research study is the determination of the sample size and whether the sample size will provide an adequate representation to test the hypotheses. If the sample size is too low, reliability can become a concern; however, if the sample size is too large, additional resources may have been utilized only to receive a minimal gain in the end (Scheaffer, Mendenhall, & Ott, 2006). Sample sizes can be determined by employing a sample size of a similar study, utilizing published tables, or applying formulas to calculate a sample size.

In addition, a sample size for a study can be calculated by determining the preferred confidence level, as well as the acceptable amount of error (Meier & Brudney, 1992). An acceptable level of alpha among researchers is set at .05 (95%) (Bickman & Rog, 2009), which was used for this study. In utilizing the desired alpha = .05, the above mentioned population, a margin of error of $\pm$ 5, and a simple random sampling technique, the sample size was estimated around 385 law enforcement investigators for each group.

In the end, the sample size of 404 for each group was distributed. This sample size was determined as it allowed all local law enforcement agencies an opportunity to participate in the study. The same amount of questionnaires were distributed to each agency, depending on the group to which they belonged; those that participate in the FINDER system and those agencies that do not participate in the FINDER information sharing system.

Data Collection

The questionnaire packets included a cover letter, the appropriate questionnaire, and a self-addressed, pre-paid postage envelope. Dillman (1978) suggests that mail questionnaires address the agency head and ask that the questionnaire be "passed on" to the appropriate individual. This procedure is recommended in an effort to control the selection of respondents when the individual is unknown. Each cover letter was addressed to the agency head of the sheriff's office and respective municipal police department. The letter requested that a specified number of law enforcement investigators complete the questionnaires. One concern with relying on the agency head is that the questionnaire may simply be discarded and therefore not participate in the study. Also, the questionnaire may be distributed but never completed and returned (Dillman, 1978). Another concern with this method is the agency head may insert selection bias by choosing certain individuals to produce responses espoused by the agency CEO.

The cover letter not only explained the purpose of the study and provided contact information, but also provided the law enforcement personnel with directions on how to complete the questionnaire. The letter also denoted that participation in the questionnaire was confidential and although the results may increase future advancement in the field of information sharing within law enforcement, participation was strictly voluntary. The questionnaires did not request the identification of the agency where the respondent was employed. The researcher was able to decipher if the agency responding was a FINDER or non-FINDER agency based on the type of the questionnaire that was submitted. As stated previously, appropriate questionnaires were sent to those agencies, based on a list obtained, that used FINDER or another information sharing

system.   Although participants were encouraged to answer all questions, they had the opportunity to skip questions.

Participants had two options for completing the questionnaire. Option one consisted of the participant using a hard copy and returning the questionnaire in the postage paid, self-addressed envelope. The second option was to complete the questionnaire online. Survey Monkey was utilized for both questionnaires. Questionnaires were mailed to the law enforcement agencies the week of December 19, 2011, and respondents were asked to return the questionnaires no later than January 31, 2012.

Instrument Development

As stated earlier, the primary focus of this research is related to examining case solvability and investigative success through the use of information sharing systems. Thus, it was imperative to determine what investigative success entails, and specifically how this is related to case solvability. Additionally, subject matter experts in the investigative law enforcement field were consulted to discuss the notion of investigative success and determine what factors are potential influences. Such individuals included investigative personnel at the line level to law enforcement agency heads. Through interviews and the literature review, it was determined that case solvability factors and investigative successes included the following:

- witness information

- associate information

- weapon information

- forensic information

- vehicle information

- similar modus operandi information

- demographic information

- address information

- past historical/background information

- additional information (i.e. phone numbers, etc.)

- recovering property

- identifying suspects

- located persons pertinent to the case

- recovering vehicles

- obtaining case leads

- field information report (FIR) information that aided a case

- information that provided a link to another criminal or crime

Once information was gathered to identify the study dimensions and questionnaire items were developed, subject matter experts and academics that are specialists in this area pre-tested the questionnaire. This pre-test included investigators from within the law enforcement field similar to the study population. The questionnaire for those investigators that have access to FINDER was pre-tested as well as investigators that do not have access to FINDER. Pre-test feedback was collected and comments related to the ease of completing the questionnaire, the time it took, the flow of the questions, face validity, content validity, and any complexity with the questionnaire itself were considered. Overall, the pre-test received positive comments with little

need for modification. The modifications that did occur included the duplication of one item and rewording several other items.

Two questionnaires were developed and utilized. One questionnaire was developed for the agencies that participate in the FINDER system and a second for those agencies that do not participate in the FINDER system. The questionnaires contained several types of questions related to: attitudes, beliefs, behavior, and attributes. Questions related to attitudes reflect how a respondent feels about a situation or item; whereas questions seeking about one's beliefs are an assessment of what the respondent believes is true or false. Questions pertaining to a respondent's behavior reflect one's beliefs about their behavior and the fourth type of question relates to attributes, which reflects the personal demographics or characteristics (Dillman, 1978). The questionnaire items were comprised of open-ended, close-ended with ordered choices, close-ended with unordered response choices, and partially close-ended choices. Once the questionnaires were formulated, the researcher provided two response methods. One method included the use of a hard copy that could be returned to the researcher in a pre-paid postage envelope and the other method included using the online survey program, Survey Monkey.

<u>Survey Instrument</u>

Several methods of questionnaire formulation, distribution, and implementation have been studied; however, results have been mixed and often contradictory, due in part to the way the research was conducted (Dillman, 1978). In his book, *Mail and Telephone Survey: The Total Design Method*, Dillman (1978), provides important criteria in an effort to ensure the instrument,

administration, and analysis are optimally executed. The Dillman method was used to develop

and administer the survey.

It was determined through the pre-testing that the amount of time to complete the

questionnaire was approximately fifteen minutes. In terms of monetary cost, there was no cost to

the participant or the participant's respective agency. Each mailed survey included a postage-

paid, self-addressed envelope for return. In regards to confidentiality, FINDER users were asked

to provide their user name; however, this information would not be released or published. All

questions were voluntary.

Information sharing within the law enforcement field has come to the forefront. In regards to

the rewards for the respondents, information derived from the research will be available to

potentially improve FINDER. For those that utilize a different information sharing system, the

rewards are similar. They are part of a study that will provide important information related to

law enforcement information sharing and investigative success.

A final notion is that of trust between the researcher and the respondent. Although there were

no monetary participant incentives available, the researcher did provide the postage-paid, self-

addressed envelope. The affiliation with the University of Central Florida, along with the

support of a UCF faculty member provided legitimacy. Respondents may be more likely to

generate trust if the researcher is affiliated from a known and established organization (Dillman,

1978).

Questionnaire Distribution

The questionnaires were distributed by mail. Each agency head received a questionnaire packet, which included a cover letter outlining the purpose of the study, the respective questionnaires, and a self-addressed, pre-paid postage return envelope. As stated previously, participants had the option to complete the questionnaire by hand and return via mail or complete the questionnaire online by January 31, 2012.

Statistical Model

In order to test the various hypotheses, a multivariate technique was utilized for this study. More specifically, OLS multivariate regression was utilized to review the case solvability and investigative success for those investigators that utilize FINDER. In addition, an independent samples t-test was conducted to compare the case solvability and investigative success for those investigators that utilize FINDER and those investigators that utilize an alternative information sharing system. Prior to conducting the analysis, the assumptions of normality were tested.

A preliminary analysis of descriptive statistics was used in conjunction with the statistical model. In conducting descriptive statistics, the researcher was able to review such information as the mean, standard deviation, range of scores, etc. The statistical software program, SPSS, version 21.0 was utilized in conducting the various analyses for this study.

Summary

By conducting a mixed-methods, self-administered survey; hypotheses were developed to test the law enforcement information sharing FINDER system. The sample was drawn from those

law enforcement investigators whose agency participates in the FINDER system and those investigators whose agency does not participate in the system. Data was collected through a survey methodology, in which the questionnaire was completed by the investigator either online or on paper and returned to the researcher. The questionnaire was accompanied by a letter explaining the purpose of the questionnaire and study, as well as explaining that the participation in the study was voluntary. To analyze the statistical results, regression analysis, t-test, and various descriptive and exploratory analyses were selected by utilizing the SPSS, version 21.0 software program. Chapter 4 will provide the findings and analyses of the questionnaires while Chapter 5 will discuss any recommendations, as well as the limitations that the study encompassed.

CHAPTER 4: FINDINGS

Introduction

The study's findings are presented here along with the survey results. Descriptive statistics are used for an initial examination of the findings. Reliability and validity issues are discussed along with the multivariate regression and t-test results.

Survey Responses

As discussed earlier, 404 surveys were sent to local Florida law enforcement police departments and sheriff's offices that participate in the FINDER law enforcement information sharing system. Law enforcement investigators were asked to complete the surveys. One-hundred fifty-seven surveys were completed and returned. This is a response rate of 38.86%; however, 12 responses were completed by agency support staff that included crime analysts and patrol officers. These individuals were not serving dedicated investigative functions and since the study focused on law enforcement investigators, the 12 responses were not included in the analysis. Thus the final investigator response rate was 35.89% (N=145). Of the 145 responses, 109 (75.2%) were completed by police department investigators and 36 (24.8%) by sheriff's office investigators.

Four-hundred and four surveys were sent to local Florida law enforcement agencies that do not use FINDER. These agencies have access to law enforcement information; however, the access is via a mixture of diverse systems that in most cases do not provide as much information as the FINDER system. Generally, non-FINDER agencies use a variety of separate data sources

that are not aggregated into a single search and retrieval application such as FINDER. Also, non-FINDER systems often do not contain the same scope of information as FINDER. The lack of pawn records is one example. Eighty-seven were completed and returned either via regular mail or electronically. The response rate for the non-FINDER group was 21.5%. Of the 87 responses, 67 (77%) were completed by investigators from police departments and 20 (23%) were completed by sheriff's office investigators.

Power Analysis

In the prior methodology section a detailed description was provided about the sample size calculation. It was determined a sample size of 385 produced a ± 5% margin of error. Power Analysis is an additional tool that is used to determine sample size. An a priori power analysis was also conducted to validate the selected sample size. An adequate sample size affects the validity of the study (Gliner & Morgan, 2000). To determine the power analysis of a study, several factors are taken into consideration: effect size, significance level, statistical power, and sample size. By knowing three out of the four factors, the fourth can be determined.

The alpha was set at .05 for the study's t-tests, a large effect size was employed (.8), and it was determined that the study would require a power of .80. Based on these parameters, it was concluded that for the t-tests the sample size for each group would require 64 subjects. The post hoc power analysis was conducted and based on the responses for each group; the result was a power of .99. Based on the size calculation, it appears that the number of responses in this study is sufficient.

In terms of the linear regression statistical analysis, a post hoc power analysis was conducted. Given the response rather, and after examining the responses to ensure there were no violations of the regression assumptions, the number of responses was sufficient to produce a power of 1.00, based on a .80 effect size for both the case solvability and investigative success models.

<div align="center">Descriptive Analysis</div>

User Information: FINDER and Non-FINDER Participants

Survey items 4-9 in the FINDER questionnaire and survey items 3-8 in the non-FINDER questionnaire pertained to characteristics of the respondents:

1. type of crimes that they investigate;

2. average case load per month;

3. number of years in their current position;

4. number of years with their current agency;

5. number of years in law enforcement; and,

6. number of years as a law enforcement investigator.

Table 1 below, provides the results of the survey items related to the type of crimes FINDER and non-FINDER system users investigated when the survey was administered. The crime investigation options included:

1. property

2. person

3. sex offenses

4. financial

5. robbery

6. fraud

7. homicide

8. internet

9. narcotics

10. other crimes

Property crimes include criminal offenses such as larcenies and burglaries while; person crimes include offenses such as batteries and assaults. Survey participants were not limited to choosing one criminal offense, but all offenses they investigate. Table 1 illustrates the types of crimes investigated by the survey respondents.

Table 1: Types of Crimes Investigated by FINDER and Non-FINDER Participants

	FINDER Participants			Non-FINDER Participants	
Type of Crime	Frequency	Percent	Type of Crime	Frequency	Percent
Investigate Property	127	87.6%	Investigate Person	64	73.6%
Investigate Person	85	58.6%	Investigate Robbery	62	71.3%
Investigate Fraud	84	57.9%	Investigate Property	55	63.2%
Investigate Financial	81	55.9%	Investigate Fraud	51	58.6%
Investigate Robbery	78	53.8%	Investigate Sex Offenses	50	57.5%
Investigate Sex Offenses	77	53.1%	Investigate Financial	50	57.5%
Investigate Homicide	70	48.3%	Investigate Homicide	44	50.6%
Investigate Internet	64	44.1%	Investigate Internet	44	50.6%
Investigate Narcotics	38	26.2%	Investigate Narcotics	30	34.5%
Investigate Other	18	12.4%	Investigate Other	5	5.7%

The top six categories vary in order slightly between those of the FINDER and non-FINDER participants. For the FINDER group, the top three, in order of frequency consisted of property (87.6%), person (58.6%), and fraud (57.9%). The top three for the non-FINDER group, in order of frequency, consisted of: person (73.6%), robbery (71.3%), and property (63.2%). The final four categories, in order of frequency, were the same for both groups; homicide, internet, narcotics, and other crimes. In regards to the additional questions pertaining to the investigator's average case load and years of experience, descriptive statistics were compiled and depicted in Table 2.

Table 2: Investigator Descriptive Statistics – FINDER and Non-FINDER Participants

Participant Information	FINDER Participants					Non-FINDER Participants			
	N	Min.	Max.	Mean		N	Min.	Max.	Mean
Average Case Load	130	2	80	21.19		80	2	120	20.08
Years in Current Position	145	0	40	4.93		84	1	18	3.99
Years at Current Agency	145	0	28	11.88		86	2	34	11.84
Years as L.E. Investigator	141	0	33	7.50		83	1	23	7.24
Years in L.E.	145	2	41	14.11		87	2	43	14.90

For FINDER participants, the average case load was 21. The average years in their current position was just under 5, and 7.5 total years as a law enforcement investigator. Time at their current agency was just under 12 years, while the total years in law enforcement averaged 14 years.

For non-FINDER participants, the average case load was 20, the average years in their current position was just under 4, and 7 total years as a law enforcement investigator. Years at their current agency was estimated to be about 12 years, while the total years in law enforcement averaged just less than 15. These characteristics of both the non-FINDER participants and FINDER participants are similar.

Use of the FINDER and non-FINDER System

Questions 10 through 13 examined the investigator's use of the system as follows: the month and year they began using the system, how often they utilized the system, if they had continuous access to the system, and the type of cases in which they utilized the system.

In regards to when the respondents began using the system, the average time for FINDER participants was 2 – 3 years ago (2.60) compared to 3 – 4 years ago (3.59) for non-FINDER participants. The question related to how many years the respondents had been utilizing the system was a free text response. Table 3 depicts the results of these items. The difference between the two groups will be discussed further in the following chapter.

Table 3: Use of FINDER and Non-FINDER System

System Information	FINDER Participants					Non-FINDER Participants			
	N	Min.	Max.	Mean		N	Min.	Max.	Mean
Began Using System	124	1	7	2.60		74	1	15	3.59
Frequency	143	1	5	3.50		85	1	5	3.99
System Access	141	1	2	1.06		86	1	2	1.07

Explanation of mean:
Began Using System: Responses in number of years
Frequency: 1 = almost never; 2 = a few times a month; 3 = a few times a week; 4 = almost every day; 5 = every day
System Access: 1 = have continuous access to system; 2 = do not have continuous access to system

Table 4: FINDER and Non-FINDER System Frequency

System Use	FINDER Participants			Non-FINDER Participants		
	Frequency	Percent	Valid Percent	Frequency	Percent	Valid Percent
Almost Never (1)	4	2.8	2.8	3	3.4	3.5
A Few Times a Month (2)	21	14.5	14.7	8	9.2	9.4
A Few Times a Week (3)	47	32.4	32.9	14	16.1	16.5
Almost Every Day (4)	41	28.3	28.7	22	25.3	25.9
Every Day (5)	30	20.7	21.0	38	43.7	44.7

Question 11 pertained to the investigator's frequency of use of the system. The results are illustrated in Table 3 and Table 4. The choices included, almost never (1); a few times a month (2); a few times a week (3); almost every day (4); and every day (5). The mean for FINDER participants was 3.50 which denoted a few times a week (3). In addition, a frequency analysis was conducted, which denoted that out of the 145 FINDER responses, there were 2 missing, which brought the responses to 143. The results of the FINDER responses were as follows: few times a week 47 (32.4%); almost every day 41 (28.3%); every day 30 (20.7%); a few times a month 21 (14.5%); and finally, almost never 4 (2.8%).

The mean for non-FINDER participants was 3.99 which denoted a few times a week (3). Out of 87 responses in the frequency analysis, there were 2 missing. The response results were: every day 38 (43.7%); almost every day 22 (25.3%); a few times a week 14 (16.1%); a few times a month 8 (9.2%); and finally almost never 3 (3.4%). The results are provided above in Table 4 located on the previous page.

In addition to question 11 regarding system use, question 12 inquired as to whether or not the respondents had continuous access to the systems. Out of 145 FINDER surveys completed, 141 responded to this survey item. One hundred thirty-three (91.7%) noted that they do have continuous access to FINDER, whereas 8 (5.5%) stated that they do not. Out of the 87 non-FINDER responses, there was 1 non-response. Eighty (92%) noted that they do have continuous access to their system, whereas 6 (6.9%) stated that they do not.

Similar to question 4, which examined the type of cases the participants investigated, the final question pertained to the frequency of cases they investigated when using the system. Table 5 provides these results from both user groups.

Table 5: Type of Investigative Case Frequency for FINDER and Non-FINDER

	FINDER Participants			Non-FINDER Participants		
Type of Crime	Frequency	Percent	Type of Crime	Frequency	Percent
Investigate Property	135	93.1%	Investigate Person	73	83.9%
Investigate Person	83	57.2%	Investigate Property	66	75.9%
Investigate Fraud	70	48.3%	Investigate Robbery	61	70.1%
Investigate Robbery	68	46.9%	Investigate Fraud	56	64.4%
Investigate Financial	57	39.3%	Investigate Financial	53	60.9%
Investigate Sex Offenses	47	32.4%	Investigate Homicide	49	56.3%
Investigate Homicide	40	27.6%	Investigate Sex Offenses	46	52.9%
Investigate Internet	36	24.8%	Investigate Internet	40	46.0%
Investigate Narcotics	29	20.0%	Investigate Narcotics	39	44.8%
Investigate Other	16	11.0%	Investigate Other	6	6.9%

The results show the majority of FINDER respondents investigated property crimes, followed by person crimes, fraud, robbery, financial, sex offenses, homicide, internet, narcotics, and other crimes not listed. The result for this item is similar to question 4 except the categories of robbery and financial crimes were interchanged.

It is clear the majority of the non-FINDER respondents investigated person crimes, followed by property crimes, robbery, fraud, financial, homicide, sex offenses, internet, narcotics, and other crimes not listed.

In conclusion, the non-FINDER participants began using their system approximately 1 year earlier (3-4 years ago) than the FINDER group (2-3 years ago). In terms of frequency, both the FINDER and non-FINDER participants averaged utilizing the system a few times a week. The majority, 91.7% of FINDER and 92% of non-FINDER participants noted that they do have continuous access. Finally, the frequency of crimes investigated using the respective systems varied slightly in terms of order. Both user groups were similar in regards to the utilization of the system as it pertained to the types of cases that they investigated.

Case Solvability / Investigative Success using the FINDER System

Questions 30 through 46 are measures of case solvability and investigative success. These survey items involved Likert-type scales. For questions 30 and 31a-j, the respondents could choose among the following: strongly disagree (1); somewhat disagree (2); disagree (3); neither agree or disagree (4); agree (5); modestly agree (6); and strongly agree (7). For questions 32 through 46, the options for a response consisted of the following: up to 20% (1); 21-40% (2); 41-60% (3); 61-80% (4); 81-100% (5); and NA (6). The percentage response refers to the

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respondent's view that the system provided the information to assist in the various investigative

success variables (recover property, identify suspects, etc.). For example, the respondent

estimated the percentage property recovered, persons located, etc. that was assisted by the

information system. Tables 6 and 7 provide the descriptive results pertaining to the responses for

case solvability and investigative success for both user groups.

Table 6: Case Solvability Using the FINDER and Non-FINDER Systems

	FINDER Participants		Non-FINDER Participants	
Case Solvability Factors	N	Mean	N	Mean
Ability to Solve Cases	145	5.83	85	5.56
Witness Information Provided	144	5.08	81	4.12
Associate Information Provided	145	5.16	82	4.50
Weapon Information Provided	144	4.47	81	3.75
Forensic Information Provided	142	4.06	81	3.37
Vehicle Information Provided	144	5.04	82	4.90
M.O. Information Provided	143	4.24	82	3.54
Address Information Provided	145	5.74	82	5.07
Suspect Information Provided	145	5.76	81	4.84
Victim Information Provided	142	5.36	82	4.71
Additional Information Provided	70	5.06	68	4.40

Response categories:
1 = strongly disagree; 2 = somewhat disagree; 3 = disagree; 4 = neither agree or disagree; 5 = agree; 6 = modestly agree; 7 = strongly agree

Table 7: Investigative Success Using the FINDER and Non-FINDER Systems

Investigative Success Factors	FINDER Participants		Non-FINDER Participants	
	N	Mean	N	Mean
% Facilitated Arrests	124	1.73	65	2.52
% Assisted Property Recovered	125	2.04	51	2.04
% Assisted Suspects Identified	131	2.16	72	2.90
% Assisted Persons Located	127	2.19	72	2.99
% Assisted Vehicles Recovered	60	1.52	46	1.89
% Aided Case Leads	130	2.33	68	2.97
% Aided FIR Information	93	2.04	56	2.63
% Provided Link to Crime/Criminal	119	2.00	61	2.30

Response categories:
1 = up to 20%; 2 = 21-40%; 3 = 41-60%; 4 = 61-80%; 5 = 81-100%; 6=NA (option 6 was excluded to determine the mean)
The percentages correspond to the respondent's view that the system provided the ability to assist in the various investigative success variables (make arrests, recover property, identify suspects, etc.).

As Table 6 (Case Solvability) illustrates, the mean for the responses for FINDER participants ranged from 4.24 (neither agree nor disagree) to 5.83 (agree). As Table 6 depicts, the mean for the non-FINDER responses ranged from 3.37 (disagree) to 5.56 (agree). In all of the categories, the FINDER group had a higher average score than the non-FINDER group.

The questions in Table 7 pertain to the investigative success using both systems. The percentages correspond to the respondent's view that the system provided the ability to assist in the various investigative success variables (recover property, identify suspects, etc.) and indicates the investigator had a certain level of likelihood of being successful within that category. As Table 7 illustrates, in all but one of the categories, % assisted property recovered; the non-FINDER group had a higher average score than the FINDER group. These results are contrary of those for the case solvability factors and will be further explored in the following chapter.

In conclusion, the responses between the two groups were similar in some aspects. For the first series of questions pertaining to case solvability, the results from the FINDER participants indicate that the mean responses for each of the case solvability factors ranged from neither agree nor disagree to agree; whereas, the mean results for non-FINDER participants ranged from disagree to agree. In terms of investigative success, the mean for each of the variables related to FINDER participants primarily consisted of a range from 1 (up to 20%) to 2 (21-40%); while the mean for the non-FINDER participants for the same responses were all 2 (21-40%), with the exception of % assisted vehicle recovered (1.89). Although there were similarities, the FINDER group had a higher mean in all of the case solvability factors; whereas the non-FINDER group

had a higher mean in all but one of the investigative success factors. These findings will be further explored in the following chapter.

Case Solvability & Investigative Success Variables

Two hypotheses and two propositions were created to examine the relationships between case solvability and investigative success variables. The two hypotheses are presented below:

Ho1: Certain categories of information provided by FINDER increases case solvability. These are:

        a. Witness information

        b. Associate information

        c. Weapon information

        d. Forensic information

        e. Vehicle information

        f. M.O. information

        g. Address information

        h. Suspect information

        i. Victim information

        j. Additional information

Ho2:   Certain investigative success factors provided in FINDER, present information that

improves the chances for increased arrests. These are:

  a. Property recovered

  b. Suspects identified

  c. Persons located

  d. Vehicles recovered

  e. Case leads determined

  f. FIR information

  g. Information that is linked to another crime

In addition to the two hypotheses, two propositions were formulated for this study. The

propositions were used for the non-FINDER group because they do not use a common

information sharing system. In addition, each of the non-FINDER systems has different features

than FINDER and those specific features and capabilities of the various systems were unknown.

The lack of specific information related to the features of the non-FINDER systems created

internal validity issues that could not be addressed. The propositions are as follows:

Proposition 1: Case solvability information for FINDER users is equal to case solvability

information for non-FINDER users.

Proposition 2: Investigative success information for FINDER users is equal to investigative

success information for non-FINDER users.

As stated in the previous chapter, the statistical analyses utilized for this study includes two

regression analyses for the hypotheses. A t-test was completed for the two propositions;

however, this is for exploratory purposes as the various information systems are not identical.

As a review, the case solvability independent variables included the following predictors:

1. witness information (question 31a)

2. associate information (question 31b)

3. weapon information (question 31c)

4. forensic information (question 31d)

5. vehicle information (question 31e)

6. modus operandi information (question 31f)

7. address information (question 31g)

8. suspect information (question 31h)

9. victim information (question 31i)

10. additional information (question 31j)

The investigative success independent variables included the following predictors:

1. property recovered (question 33)

2. suspects identified (question 34)

3. persons located (question 35)

4. vehicles recovered (question 36)

5. case leads (question 37)

6. field information report (FIR) information that aided a case (question 38)

7. information linked to another crime/criminal (question 39)

Prior to conducting the analysis, a review of the case solvability variables were examined and evaluated to determine if any variables were measuring the same concept. These variables were

constructed on information obtained from subject matter experts, as well as a literature review on case solvability and investigative success factors. Based on a correlation matrixes of the case solvability and investigative success independent variables, there were no correlations that exceeded a .80. Therefore all the case solvability and investigative success variables were considered for the models.

A further evaluation of the variables was conducted to examine the response rate. The lack of responses and/or NA responses may be problematic. This could be an indication that either there is an issue with the question itself, or the information sharing system does not provide such information. The case solvability independent variables that were excluded were:

- Forensic Information (31d): out of 145 questionnaires, 80 indicated that they neither agree nor disagree with the statement.

- Additional Information (31j): out of 145 questionnaires, there were only 70 responses.

The excluded investigative success independent variable was:

- Vehicle Recovered (36): out of 145 questionnaires, 85 selected the NA response.

Prior to conducting the regression analysis, the Kolmogorov-Smirnov, test of normality, was conducted on the dependent variables. As the results display in Table 8, the significance level for both dependent variables is .000, suggesting a violation of the assumption of normality. By definition, Likert scales are not normally distributed and therefore will impact normality; however, they can still be utilized and considered appropriate when conducting analysis (Norman, 2010).

Table 8: Kolmogorov-Smirnov Test of Normality

	Statistic	df	Sig.
Cases Solved	.214	145	.000
% Facilitated Arrests	.323	124	.000

Statistical Analysis - Regression

A one-tailed multiple regression analysis was utilized pertaining to the FINDER participants and the related hypotheses. The purpose of the multiple linear regression is to explore the predictive ability of a set of independent variables (Pallant, 2007). Two models utilizing the regression analysis were conducted for those investigators that participate in the FINDER system using the enter method. The dependent variables included the ability to solve cases (Model 1) and the percent of arrests facilitated by the use of FINDER (Model 2). After conducting the preliminary analysis as noted above; the following independent variables were selected for the study:

Regression Model 1: Case Solvability Independent Variables

1. witness information (question 31a)

2. associate information (question 31b)

3. weapon information (question 31c)

4. vehicle information (question 31e)

5. modus operandi information (question 31f)

6. address information (question 31g)

7. suspect information (question 31h)

8. victim information (question 31i)

Regression Model 2: Investigative Success Independent Variables

1. property recovered (question 33)

2. suspects identified (question 34)

3. persons located (question 35)

4. case leads (question 37)

5. FIR information (question 38)

6. information linked to another crime/criminal (question 39)

For the statistical analysis, it should be noted that for the questionnaire items that had NA for a response option were eliminated from the analysis.

FINDER Regression Analysis – Model I: Dependent Variable - Ability to Solve Cases

Table 9: Correlations Model 1 (Dependent Variable – Ability to Solve Cases)

Variables	Solve Cases	Witness Info.	Associate Info.	Weapon Info.	Vehicle Info.	M.O. Info.	Address Info.	Suspect Info.	Victim Info.
Solve Cases	1.000	.558	.581	.404	.579	.238	.681	.673	.525
Witness Info.	.558	1.000	.787	.554	.732	.459	.676	.650	.779
Associate Info.	.581	.787	1.000	.554	.726	.466	.707	.664	.649
Weapon Info.	.404	.554	.554	1.000	.618	.661	.435	.413	.341
Vehicle Info.	.579	.732	.726	.618	1.000	.574	.668	.621	.659
M.O. Info.	.238	.459	.466	.661	.574	1.000	.407	.335	.351
Address Info.	.681	.676	.707	.435	.668	.407	1.000	.876	.688
Suspect Info.	.673	.650	.664	.413	.621	.335	.876	1.000	.717
Victim Info.	.525	.779	.649	.341	.659	.351	.688	.717	1.000

Based on the correlation matrix, there do not appear to be any variables that have a correlation above .8, indicating that each variable is independent and not related to one another.

Table 10: Model Summary Model 1 (Dependent Variable – Ability to Solve Cases)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.735	.541	.513	.891

Table 10 provides information pertaining to how much variance in the dependent variable is explained by the model. The R square value is .541 and indicates that the model explains 54.1 percent of the variance in the ability to solve cases.

Table 11 provides data that assesses the statistical significance of the results. In Model 1, the statistical significance is .000 and indicates that the model is significant in predicting the dependent variable.

Table 11: ANOVA Model 1 (Dependent Variable – Ability to Solve Cases)

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	123.395	8	15.424	19.432	.000

Table 12 provides the details about each of the model variables and measures of their contribution. For the variables that are significant, the model indicates that vehicle information, M.O. (modus operandi) information, addresses information, and suspect information are the major equation factors. The contribution that each of these variables makes to the model include the following: address information (.296), suspect information, (.267), vehicle information (.214), and M.O. (modus operandi) information (-.213). The results of these variables will be discussed further in the final chapter.

Table 12: Coefficients Model 1 (Dependent Variable – Ability to Solve Cases)

Variable	B	Std. Error	Beta	t-statistic	Sig.*	Partial Corr.	Part Corr.	Tolerance	VIF
Constant	1.529	.402		3.803	.000				
Witness Information	.046	.117	.048	.391	.348	.034	.023	.228	4.387
Associate Information	.058	.092	.069	.635	.263	.055	.037	.296	3.375
Weapon Information	.111	.077	.130	1.429	.078	.123	.084	.418	2.391
Vehicle Information	.194	.096	.214	2.024	.023	.174	.119	.312	3.202
M.O. Information	-.203	.079	-.213	-2.564	.001	-.218	-.151	.506	1.975
Address Information	.320	.145	.296	2.212	.015	.189	.130	.195	5.138
Suspect Information	.284	.139	.267	2.034	.022	.174	.120	.201	4.964
Victim Information	-.059	.103	-.063	-.572	.284	-.050	-.034	.284	3.521

*p-value has been adjusted for a one-tailed regression

Table 12 provides information related to tests for multicollinearity using both the Tolerance and VIF. "Tolerance is an indicator of how much of the variability of the specified independent is not explained by the other independent variables in the model" (Pallant, 2007, p. 156). Tolerance that has a value less than .10 indicates that the multiple correlations with other variables is high and indicating the possibility of the presence of multicollinearity (Mertler & Vannatta, 2002). In Model 1 above, all variables are greater than .10 indicating that there is little concern with the presence of multicollinearity.

In addition, the VIF, which is the inverse of Tolerance, also was examined. VIF values greater than 10 would be a concern and lead to an indication of multicollinearity (Mertler & Vannatta, 2002). In Model 1, none of the variables are greater than a 10, which indicates multicollinearity is not a factor.

A second model was developed to examine how arrests were facilitated through the use of FINDER. The results are provided below in Tables 13- 16.

FINDER Regression Analysis – Model 2: Dependent Variable - Arrests Facilitated by FINDER

Table 13: Correlations Model 2 (Dependent Variables – Arrests Facilitated by FINDER)

Variable	% Facilitated Arrests	% Property Recovered	% Suspects Identified	% Persons Located	% Case Leads	% FIR Info.	% Link Crime
% Facilitated Arrests	1.000	.597	.684	.502	.570	.501	.477
% Property Recovered	.597	1.000	.668	.454	.504	.524	.411
% Suspects Identified	.684	.668	1.000	.628	.696	.589	.661
% Persons Located	.502	.454	.628	1.000	.627	.652	.564
% Aided Case Leads	.570	.504	.696	.627	1.000	.736	.648
% Aided FIR Information	.501	.524	.589	.652	.736	1.000	.599
% Link Crime	.477	.411	.661	.564	.648	.599	1.000

The correlation matrix does not reveal any variables that have values above .08; therefore, it appears each independent variable is independent and not related to one another.

Table 14: Model Summary Model 2 (Dependent Variables – Arrests Facilitated by FINDER)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
2	.720	.519	.480	.720

Table 14 indicates the R square value is .519, or the model explains 51.9 percent of the variance in the ability to solve cases.

Table 15 shows the model is significant at an alpha level of .000.

Table 15: ANOVA Model 2 (Dependent Variables – Arrests Facilitated by FINDER)

Model	Sum of Squares	Df	Mean Square	F	Sig.
2 Regression	41.925	6	6.988	13.485	.000

Table 16 provides the details about each of the model variables and measures of their contribution. For the variables that are significant, the model indicates that % property recovered and % suspects identified are the major equation factors. The contribution that each of these variables makes to the model include the following: % suspects identified (.391) and % property recovered (.236).

Table 16: Coefficients Model 2 (Dependent Variables – Arrests Facilitated by FINDER)

Variable	B	Std. Error	Beta	t-Statistic	Sig.*	Partial Corr.	Part Corr.	Tolerance	VIF
Constant	.203	.201		1.013	.157				
% Property Recovered	.195	.092	.236	2.120	.019	.238	.170	.516	1.936
% Suspects Identified	.338	.125	.391	2.709	.004	.299	.217	.308	3.247
% Persons Located	.053	.104	.059	.510	.306	.059	.041	.472	2.118
% Aided Case Leads	.119	.117	.141	1.020	.156	.117	.082	.336	2.979
% Aided FIR Information	.009	.116	.010	.074	.471	.009	.006	.368	2.716
% Link Crime/Criminal	-.008	.106	-.009	-.079	.469	-.009	-.006	.463	2.158

*p-value has been adjusted for a one-tailed regression

Table 16 provides information related to tests for multicollinearity using both the Tolerance and VIF. "Tolerance is an indicator of how much of the variability of the specified independent is not explained by the other independent variables in the model" (Pallant, 2007, p. 156). Tolerance that has a value less than .10 indicates that the multiple correlations with other variables is high and indicating the possibility of the presence of multicollinearity (Mertler & Vannatta, 2002). In Model 2 above, all variables are greater than .10 demonstrating that there is little concern with the presence of multicollinearity.

In addition, the VIF, which is the inverse of Tolerance, also was examined. VIF values greater than 10 would be a concern and lead to an indication of multicollinearity (Mertler & Vannatta, 2002). In Model 2, none of the variables are greater than a 10, which indicates multicollinearity is not a major factor.

Statistical Analysis – T-Test

The independent sample t-test analysis was used to compare investigator responses from both user groups. Two groups of t-tests were constructed. In the first group, the variables included case solvability information in the system (FINDER or non-FINDER). In the second group, the variables include the percent of arrests that were facilitated by the information system and investigative success factors (FINDER or non-FINDER).

Reviewing the data in Table 17 and 18, the following results were determined:

1. There was a significant difference in witness information provided for FINDER (M=5.08, SD=1.346) and Non-FINDER (M=4.12, SD=1.826) conditions; t(129.585)=4.140, p=.000. The difference in the means was a moderate effect size (eta squared = .07).

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2. There was a significant difference in associate information provided in FINDER (M=5.16, SD=1.508) and Non-FINDER (M=4.50, SD=1.780) conditions t(225)=2.959, p=.003. The difference in the means was a small effect size (eta squared = .04).

3. There was a significant difference in weapon information provided in FINDER (M=4.47, SD=1.505) and Non-FINDER (M=3.75, SD=1.757) conditions t(223)=3.205, p=.002. The difference in the means was a small effect size (eta squared = .04).

4. There was no significant difference in vehicle information provided between the two groups.

5. There was a significant difference in modus operandi information provided in FINDER (M=4.24, SD=1.337) and Non-FINDER (M=3.54, SD=1.687) conditions t(139.580)=3.228, p=.002. The difference in the means was a moderate effect size (eta squared = .05).

6. There was a significant difference in address information provided in FINDER (M=5.74, SD=1.179) and Non-FINDER (M=5.07, SD=1.661) conditions t(225)=3.506, p=.001. The difference in the means was a moderate effect size (eta squared = .05).

7. There was a significant difference in suspect information provided in FINDER (M=5.76, SD=1.203) and Non-FINDER (M=4.84, SD=1.806) conditions t(120.494)=4.100, p=.000. The difference in the means was a moderate effect size (eta squared = .07).

8. There was a significant difference in victim information provided in FINDER (M=5.36, SD=1.370) and Non-FINDER (M=4.71, SD=1.760) conditions t(222)=3.084, p=.002. The difference in the means was a moderate effect size (eta squared = .04).

Table 17: Test for Equality of Variances: Collection 1

Variable		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig	t	df	Sig (2-tailed)	Mean Diff.	Std. Err. Diff.
Witness Info.	Equal variances assumed	9.063	.003	4.501	223	.000	.960	.213
	Equal variances not assumed			4.140	129.585	.000	.960	.232
Associate Info.	Equal variances assumed	.989	.321	2.959	225	.003	.659	.223
	Equal variances not assumed			2.827	146.533	.005	.659	.233
Weapon Info.	Equal variances assumed	2.906	.090	3.205	223	.002	.712	.222
	Equal variances not assumed			3.069	145.734	.003	.712	.232
Vehicle Info.	Equal variances assumed	1.044	.308	.665	224	.507	.139	.209
	Equal variances not assumed			.634	145.462	.527	.139	.220
M.O. Info.	Equal variances assumed	7.790	.006	3.435	223	.001	.701	.204
	Equal variances not assumed			3.228	139.580	.002	.701	.217
Address Info.	Equal variances assumed	2.760	.098	3.506	225	.001	.665	.190
	Equal variances not assumed			3.197	127.847	.002	.665	.208
Suspect Info.	Equal variances assumed	7.928	.005	4.577	224	.000	.919	.201
	Equal variances not assumed			4.100	120.494	.000	.919	.224
Victim Info.	Equal variances assumed	3.447	.065	3.084	222	.002	.652	.211
	Equal variances not assumed			2.886	137.895	.005	.652	.220

Table 18: Group Statistics Test – Collection 1

Variable	System Type	N	Mean	Std. Deviation	Std. Error Mean
Witness Information	FINDER	144	5.08*	1.346	.112
	Non-FINDER	81	4.12	1.826	.203
Associate Information	FINDER	145	5.16*	1.508	.125
	Non-FINDER	82	4.50	1.780	.197
Weapon Information	FINDER	144	4.47*	1.505	.125
	Non-FINDER	81	3.75	1.757	.195
Vehicle Information	FINDER	144	5.04	1.409	.117
	Non-FINDER	82	4.90	1.682	.186
M.O. Information	FINDER	143	4.24*	1.337	.112
	Non-FINDER	82	3.54	1.687	.186
Address Information	FINDER	145	5.74*	1.179	.098
	Non-FINDER	82	5.07	1.661	.183
Suspect Information	FINDER	145	5.76*	1.203	.100
	Non-FINDER	81	4.84	1.806	.201
Victim Information	FINDER	142	5.36*	1.370	.115
	Non-FINDER	82	4.71	1.760	.194

*Significant difference between FINDER & Non-FINDER / alpha level set at .05

Reviewing the data in Table 19 and Table 20, the following results were determined:

1. There was no significant difference in the % property recovered between the two groups.

2. There was a significant difference in % suspects identified for FINDER (M=2.16, SD=1.156) and Non-FINDER (M=2.90, SD=1.165) conditions; t(201)=-4.367, p=.000. The difference in the means was a large effect size (eta squared = .09).

3. There was a significant difference in % persons located for FINDER (M=2.19, SD=1.118) and Non-FINDER (M=2.99, SD=1.169) conditions; t(197)=-4.754, p=.000. The difference in the means was a large effect size (eta squared = .10).

4. There was a significant difference in % aided case leads for FINDER (M=2.33, SD=1.184) and Non-FINDER (M=2.97, SD=1.281) conditions; t(196)=-3.510, p=.001. The difference in the means was a moderate effect size (eta squared = .06).

5. There was a significant difference in % fir information for FINDER (M=2.04, SD=1.141) and Non-FINDER (M=2.63, SD=1.273) conditions; t(147)=-2.886, p=.004. The difference in the means was a moderate effect size (eta squared = .05).

6. There was no significant difference in the % link crime between the two groups.

Table 19: Test for Equality of Variances – Collection 2

Variable		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig	t	df	Sig (2-tailed)	Mean Diff.	Std. Err. Diff.
% Property Recovered	Equal variances assumed	1.926	.167	.004	174	.997	.001	.195
	Equal variances not assumed			.004	101.841	.997	.001	.188
% Suspects Identified	Equal variances assumed	.127	.722	-4.367	201	.000	-.742	.170
	Equal variances not assumed			-4.357	145.380	.000	-.742	.170
% Persons Located	Equal variances assumed	.143	.706	-4.754	197	.000	-.797	.168
	Equal variances not assumed			-4.696	142.196	.000	-.797	.170
% Aided Case Leads	Equal variances assumed	.059	.808	-3.510	196	.001	-.640	.182
	Equal variances not assumed			-3.424	127.061	.001	-.640	.187
% FIR Information	Equal variances assumed	2.679	.104	-2.886	147	.004	-.582	.202
	Equal variances not assumed			-2.809	106.244	.006	-.582	.207
% Link Crime	Equal variances assumed	.839	.361	-1.675	178	.096	-.295	.176
	Equal variances not assumed			-1.667	119.374	.098	-.295	.177

Table 20: Group Statistics Test – Collection 2

Variable	System Type	N	Mean	Std. Deviation	Std. Error Mean
% Property Recovered	FINDER	125	2.04	1.208	.108
	Non-FINDER	51	2.04	1.095	.153
% Suspects Identified	FINDER	131	2.16	1.156	.101
	Non-FINDER	72	2.90*	1.165	.137
% Persons Located	FINDER	127	2.19	1.118	.099
	Non-FINDER	72	2.99*	1.169	.138
% Aided Case Leads	FINDER	130	2.33	1.184	.104
	Non-FINDER	68	2.97*	1.281	.155
% FIR Information	FINDER	93	2.04	1.141	.118
	Non-FINDER	56	2.63*	1.273	.170
% Link to Crime/Criminal	FINDER	119	2.00	1.112	.102
	Non-FINDER	61	2.30	1.131	.145

*Significant difference between FINDER & Non-FINDER / alpha level set at .05

Evaluation of Hypothesis Testing

Ho1:   Certain categories of information provided by FINDER increases case solvability. These are:

    a. *Witness information*

        Witness information was not a statistically significant variable in the model.

    b. *Associate information*

        Associate information was not a statistically significant variable in the model.

    c. *Weapon information*

        Weapon information was not a statistically significant variable in the model.

    d. *Forensic information*

        Forensic information was eliminated from the model due to a low response rate.

    e. *Vehicle information*

        Vehicle information was a statistically significant variable in the model.

    f. *M.O. information*

        M.O. information was a statistically significant variable in the model; however, this variable presented with a negative value.

    g. *Address information*

        Address information was a statistically significant variable in the model.

    h. *Suspect information*

        Suspect information was a statistically significant variable in the model.

    i. *Victim information*

        Victim information was not a statistically significant variable in the model.

j. *Additional information*

Additional information was eliminated due to a low response rate.

Ho2:   Certain investigative success factors provided in FINDER, present information that improves the chances for increased arrests. These are:

a. *Property recovered*

Property recovered was a statistically significant variable in the model.

b. *Suspects identified*

Suspects identified was a statistically significant variable in the model.

c. *Persons located*

Persons located was not a statistically significant variable in the model.

d. *Vehicles recovered*

Vehicles recovered was eliminated from the model due to a low response rate.

e. *Case leads determined*

Case leads was not a statistically significant variable in the model.

f. *FIR information*

FIR information was not a statistically significant variable in the model.

g. *Information that is linked to another crime*

Information that is linked to another crime was not a statistically significant variable in the model.

<u>Evaluation of Propositions</u>

Proposition 1: Case solvability information for FINDER users is equal to case solvability information for non-FINDER users.

 There was a significant difference in favor of the FINDER group in the following categories: witness information, associate information, weapon information, vehicle information, modus operandi information, address information, suspect information, and victim information.

Proposition 2: Investigative success information for FINDER users is equal to investigative success information for non-FINDER users.

 There was a significant difference in favor of the non-FINDER group in the following categories: % suspects identified, % persons located, % aided case leads, and % fir information.

<u>Summary</u>

 In this study, multiple regression was used to test the two hypotheses. Independent sample t-tests were constructed for exploratory purposes for the two propositions. In addition, descriptive statistics provided comprehensive information pertaining to the investigator's characteristics, as well as their use and assessment of the system. This chapter provided detailed information pertaining to the selection of variables and the process by which they were determined. While the findings demonstrated similarities between the FINDER and non-FINDER groups, the findings also demonstrated differences. Such differences appeared to favor the FINDER group pertaining to case solvability information; whereas investigative success information that lead to arrests appeared greater in the non-FINDER group. These differences will be further explored and discussed in the following chapter. Chapter 5 will also discuss the overall study's

conclusions and limitations. Potential policy recommendations, as well as implications for future

research are also examined in the following chapter.

CHAPTER 5: CONCLUSIONS & RECOMMENDATIONS

Introduction

Law enforcement investigators require information to solve criminal cases. The ability to obtain all-source information is a challenge given that criminal offenders are mobile and cross jurisdictional boundaries. Due to this mobility, inter-agency and multi-jurisdictional information sharing among law enforcement agencies is crucial to facilitate case solvability and investigative success. The events of September 11, 2001, changed the urgency and necessity of information sharing among law enforcement agencies.

The goal of the development and implementation of law enforcement information sharing systems were to increase the availability and timeliness in the exchanging of information among law enforcement agencies, regardless of jurisdiction. As law enforcement information sharing systems have been developed and implemented, there is little literature regarding the impact of the systems on the outcome of criminal investigations. This study sought to develop a better understanding of the criticality of certain types of information in a law enforcement information system, specifically FINDER, and its relation to case solvability and success.

In addition to examining the FINDER law enforcement information system, the study presented two propositions. These propositions were provided in an attempt to determine the comparability of case solvability information and investigative success information provided in the FINDER system contrasted to non-FINDER law enforcement information systems. In Florida, the majority of non-FINDER systems do not have access to the variety and amount of inter-jurisdictional information as FINDER.

This final chapter discusses the findings of this study as they pertain to the research questions and hypotheses. In addition, the limitations and implications of the study, as well as suggestions for future studies are discussed.

<div align="center">Participant Information</div>

Summary

As noted in Chapter 4 Findings and Analysis, the FINDER and non-FINDER participants exhibited many of the same characteristics. The average case load was 21 for FINDER and 20 for non-FINDER participants. The average years for the two groups in their current position was 4.93 for FINDER and 3.99 for non-FINDER, while the years as a law enforcement investigator was approximately 7 for both groups. The average number of years at their current agency was just under 12 years for both groups, while the total years in law enforcement averaged 14.11 years for FINDER and 14.90 for non-FINDER participants. The investigators in both the FINDER and non-FINDER groups displayed similar characteristics in regards to their law enforcement experience. This is an important feature, as neither group exhibited a larger difference in law enforcement experience that could potentially account for group differences.

The study's survey asked both groups of respondents the crime types they were assigned to investigate. For those crime types that were currently assigned, the top three for the FINDER participants were property (87.6%), person (58.6%), and fraud (57.9%); whereas the top three for the non-FINDER participants were person (73.6%), robbery (71.3%), and property (63.2%). Investigators may investigate more than one type of crime in their law enforcement duties. Therefore, both groups were also asked to report all the crime types in which they used their

information system (past and present). The top three for the FINDER participants were property (93.1%), person (57.2%), and fraud (48.3%); whereas the top three for the non-FINDER participants were person (83.9%), property (75.9%), and robbery (70.1%).

Although both groups contained person and property crimes in their top three for both sets of questions, the noticeable difference was that fraud was included in the FINDER group and robbery in the non-FINDER group. This is an important difference in that fraud is a non-violent crime and robbery is classified as a violent crime. This will be discussed more below.

In terms of their use of the information system, FINDER participants averaged 2.60 years at the time of the survey; whereas non-FINDER participants averaged 3.59 years at the time of the survey. Although both groups average frequency use of the system was a few times a week (3.50 for FINDER and 3.99 for non-FINDER), the largest percentage of FINDER participants use the system a few times a week; whereas the largest percentage of non-FINDER participants use the system every day. Both groups had continuous access to their information system.

Although both the FINDER and non-FINDER groups were similar in their law enforcement experience, the two groups differ in the use of their law enforcement information systems. The non-FINDER group averaged an additional year of use than the FINDER group. In addition, while both groups had continuous access to their information system, the non-FINDER group utilized their information system more frequently than the FINDER group. This will be discussed further below.

Discussion of Participant Information

Although the types of crimes that the criminal investigators currently investigate are similar between the two groups, there are noticeable differences. The between group similarities extend

to the frequency of information system use pertaining to crimes that the criminal investigators investigate. Such differences can be attributed to the distribution of surveys among the agency, as well as the organizational structure of the investigative units. For example, some agencies may have their own robbery unit, homicide unit, and fraud unit, etc.; whereas other agencies may combine several types of criminal offenses within a unit and investigate all those types of crimes that fall under that investigative unit. Some agencies may experience certain types of crimes at a higher rate than other agencies and therefore focus additional resources on those types of crimes.

The surveys were distributed to investigators within the agency by designated representatives that were deemed appropriate. Unfortunately, it is unknown exactly how each agency selected the investigators from a particular unit to complete the survey. It is not known if the surveys were distributed among various investigative units, and if so, what types of units. Therefore, this could account for the difference between the top three categories between the two groups; specifically fraud and robbery. Thus, the differences are more than likely due to the non-random sampling distribution. Therefore, the observed differences related to crime types from the two groups (FINDER and non-FINDER) likely have little or no impact on the questions of case solvability or investigative success.

As noted previously, it appears that the FINDER participants not only began using FINDER more recently but also utilized the system less frequently than the non-FINDER participants. This is an interesting finding, as one could make the assumption that more frequent use of a system is due to pertinent information that would assist in case solvability and investigative success. On the other hand, one could also propose an investigator may use the non-FINDER system more frequently because there is less information than the FINDER system. In essence,

the FINDER system may contain all necessary information for the investigator; whereas the use of the non-FINDER system requires the investigator to keep utilizing the system in attempts that they will retrieve the necessary information. A further discussion of the case solvability and investigative success findings will be discussed below.

<div align="center">Case Solvability</div>

As previously stated, investigators rely on certain information to solve a case. This pertinent information is defined in this study as case solvability factors. Case solvability factors were determined through a review of the current literature, as well as input gathered from subject matter experts. Participants from both user groups were asked to rate whether their system provided essential case solvability information from other Florida agencies that facilitate case success. The categories included: witness information; associate information; weapon information; forensic information; vehicle information; modus operandi information; address information; suspect information; victim information; and additional information. The responses were based on a Likert-type scale with the following choices: strongly disagree (1); somewhat disagree (2); disagree (3); neither agree or disagree (4); agree (5); modestly agree (6); and strongly agree (7).

Ho1 for Case Solvability Factors

Ho1: Certain categories of information provided by FINDER increases case solvability (witness information, associate information, weapon information, forensic information, M.O. information, address information, suspect information, victim information, and additional information).

A regression analysis was conducted with the following case solvability independent variables: witness information, associate information; weapon information; vehicle information; modus operandi information; address information; suspect information; and victim information. It was determined that the model explained 54.1 percent of the variance in the ability to solve cases. The model indicated that it was significant in predicting the investigator's ability to solve cases based on the system information; specifically, the following variables were deemed significant: address information (.296), suspect information (.267), and vehicle information (.214). As stated previously, M.O. (modus operandi) information was statistically significant in the model; however, this variable presented with a negative value (-.213). Each of these variables and their respective results will be discussed in further detail below.

Significant Variables

Address Information:

The address information variable presented with the largest standardized beta coefficient: .296. Address information is an important variable in a case and can pertain to incident address, suspect address, victim address, witness address, etc. Address information may lead an investigator to obtaining further information pertaining to a case and can be crucial in various investigative success aspects of a case that may also lead to case solvability.

Suspect Information:

In this study, suspect information had a standardized beta coefficient of .267. This is a crucial variable, as criminal cases involve a suspect. As stated previously, suspects cross jurisdictional

boundaries and having pertinent information regarding these individuals from various law enforcement agencies is crucial.

Vehicle Information:

The results of the regression analysis noted that vehicle information had a standardized beta coefficient of .214. Vehicle information may lead to vehicles driven and/or registered by suspects, victims, and witnesses, etc. Vehicle information can also lead to information regarding stolen vehicles, as well as vehicles used in the commission of a crime.

M.O. Information:

The modus operandi variable had a standardized beta coefficient of -.213. This is an interesting and perplexing result as one would anticipate that as information is provided to law enforcement investigators, the ability to solve cases would increase. Upon further examination of this variable and speaking to subject matter experts, who utilize the FINDER system, it was noted that not only is there very limited information pertaining to the modus operandi in FINDER but that investigators typically do not utilize FINDER to find that specific type of information. In further review, the mean response for this variable was 4.24, indicating neither agree nor disagree. This may further indicate that participants may have been forced into a response (neither agree nor disagree) rather than a not applicable response. This variable may require further examination for future studies.

Another possible explanation for the negative standardized beta coefficient may be that the modus operandi variable was a suppressor variable. A suppressor variable is one in which the variable "has a zero (or close to zero) correlation with the criterion but is correlated with one or more of the predictor variables, and therefore, it will suppress irrelevant variance of independent

variables" (Science Dictionary, 2014). In essence, modus operandi variable has a weak positive

correlation with ability to solve cases; however, when the additional significant variables were

presented, higher modus operandi information predicts a reduced ability to solve cases.

Individual regression models were created with the modus operandi variable and each of the

significant variables. In all three cases, the modus operandi variable became insignificant;

however, a positive correlation remained. Due to several possible reasons for the negative

standardized beta coefficient, the variable remained in the model; however, the variable should

be examined in future studies.

Conclusion

These results not only indicate that the FINDER law enforcement information sharing system

provides information that leads to case solvability but also provides the specific information that

increases case solvability. As discussed previously, information is a crucial component to

investigators in solving cases. Knowing that a law enforcement information system provides

pertinent information can assist an investigator in the amount of time and resources that are spent

on gathering information in order to solve a case. This is an important step in the research of law

enforcement information sharing systems and demonstrating that the FINDER system provides

crucial case solvability information to investigators. The non-significant variables warrant

further examination to determine why and measures that could be taken to improve their

contribution to case solvability.

Proposition for Case Solvability Factors

Proposition 1: Case solvability information for FINDER users is equal to case solvability information for non-FINDER users.

To develop an understanding of the difference between the case solvability efficacy of the FINDER and non-FINDER systems, this proposition was used to examine the equivalence related to the scope of the information contained in each system. A t-test was constructed to test an exploratory proposition comparing FINDER and non-FINDER participants. The purpose of this t-test was to examine the case solvability information contained in the FINDER system and compare it to the case solvability information in the non-FINDER system to see if the systems were comparable, or if one contained greater case solvability information.

The results of the t-test determined that there was a significant difference in the following variables: witness information; associate information; weapon information; modus operandi information; address information; suspect information; and victim information. These seven variables, in which there was a significant difference, all favor the FINDER law enforcement information system and demonstrate that FINDER provided more essential case solvability information than non-FINDER in these specific categories. The remaining variable, vehicle information, indicated that there was no significant difference between the FINDER and non-FINDER groups.

Although the specifics of the non-FINDER information systems are unknown, this test provides additional support to the regression analysis that FINDER is a law enforcement information sharing system that provides the essential multi-jurisdictional information and increases the ability for investigators to solve cases.

The conceptual framework, as discussed in chapter two, theorizes that the exchange of data among and between law enforcement agencies leads to the availability of extended information and knowledge. This additional information and new knowledge can lead to investigative success for law enforcement investigators. The results indicate that the FINDER information system provides this extended network of information that leads to case solvability.

Investigative Success Discussion

Similar to the case solvability factors, the investigative success factors were determined through a review of the current literature, as well as input gathered from subject matter experts. Participants were asked to determine the proportional amount the law enforcement information system had facilitated in investigative success. The categories included: % assisted property recovered; % assisted suspects identified; % persons located; % assisted vehicles recovered; % aided case leads; % aided field report information; and % provided link to crime/criminal. The responses were based on a Likert-type scale with the following choices: up to 20% (1); 21-40% (2); 41-60% (3); 61-80% (4); 81-100% (5); and NA (6).

Ho2 for Investigative Success Factors

Ho2: Certain investigative success factors provided in FINDER, present information that improves the chances for increased arrests.

Investigative success was measured by the investigator's perception of how much the system facilitated the various investigative success factors. A regression analysis was conducted with the following investigative success variables: property recovered; suspects identified; persons

located; case leads; field report information; and information linked to another crime/criminal. It was determined that the model explained 51.9 percent of the variance in the arrests facilitated by FINDER. In addition, the model indicated that it was significant in predicting arrests facilitated by FINDER; specifically, the following variables were deemed significant: % suspects identified (.391), and % property recovered (.236).

<u>*Significant Variables:*</u>

% suspects identified:

The % suspects identified presented with the largest standardized beta coefficient: .391. Similar to the suspect information pertaining to case solvability, information regarding the suspect of a criminal case is a crucial and key piece of evidence leading to investigative success. Once a suspect is identified, other facets of investigative success can occur, which can lead to the arrest of the individual.

% property recovered:

The variables, % property recovered, had a standardized beta coefficient of .236. A major component of the FINDER information system is the data input regarding pawned items, including downloads from pawn shops themselves. The results of this model indicate that such information is provided to law enforcement investigators that results in arrests.

<u>*Conclusion:*</u>

In the regression model, two out of the six variables were significant in the facilitation of arrests: % property recovered and % suspects identified. These results not only indicate that the FINDER law enforcement information sharing system provides investigative success

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information that facilitates arrests but also provides the specific factors that increases the chances for an arrest. These findings, similar to case solvability, indicate that the FINDER law enforcement information sharing system is providing certain crucial information needed for investigators to efficiently investigate criminal cases. Although two out of the six factors were significant in the facilitation of arrests, future research would need to focus on the other four variables and their lack of a significant contribution. One explanation may be that FINDER is known for their pawn information, which may have a direct relation to property recovered and suspected identified.

Proposition 2: Investigative success information for FINDER users is equal to investigative success information for non-FINDER users.

In addition to the regression analysis, a t-test was constructed to test an exploratory proposition comparing FINDER and non-FINDER participants. The results of the t-test display that in four out of the six variables, there was a significant difference between the FINDER and non-FINDER participants. Furthermore, the t-test indicates that for these variables (% suspects identified, % persons located, % aided case leads, and % field report information); non-FINDER provided more essential investigative success information. The remaining variables tested, % property recovered and % linked to another crime/criminal, indicated that there was no significant difference between the FINDER and non-FINDER groups. This is important as investigators may not be inclined to utilize a system if it does not provide the essential investigative success information used to facilitate an arrest or further a case.

Although the results of the t-test were not as supportive for investigative success information contained in FINDER as was the case solvability model; the findings continue to suggest that the information in FINDER does provide investigative success information that can assist with arrests. These results are important as they begin to explore the information contained in the law enforcement information sharing systems and their potential impact on cases rather than on merely the operation and utilization of the system itself.

These findings are perplexing as these results were the opposite of those of case solvability and one would reason the two would have parallel results. One explanation for the difference could relate back to the distribution of the surveys and the actual investigators that completed the questionnaires. In addition, the previous section pertained to various case solvability information and how it related to solving a case. Again solving a case could include an arrest, locating an individual, recovering property, etc. This section pertaining to investigative success related specifically to arrests. A final explanation could be the survey items themselves. Reponses to investigative success factors were measured by percentages, in which investigators attempted to put a quantifiable amount on the factor itself, rather than an overall opinion. This would be an important component for future research to review and continue to test.

Implications of Study

One would contend that there are certain categories of information that are critical for solving cases and facilitating arrests. In order to optimize this information, it is crucial for the information to be available to investigators through law enforcement information sharing systems. This study examined the impact that case solvability information contained in the

FINDER law enforcement information system had on solving cases, as well as the impact that investigative success information contained in FINDER had on the facilitation of arrests. This study took an additional step to compare the case solvability and investigative success information in FINDER to non-FINDER law enforcement information systems. Was the critical information as deemed by the subject-matter experts and the literature available to investigators?

This study demonstrates that the FINDER law enforcement information sharing system is providing crucial information in certain categories to investigators in their efforts to solve cases and complete arrests; however, it also demonstrates the information categories that could be improved upon and expanded. As stated previously this study took an additional step to compare FINDER and non-FINDER groups. The purpose of this comparison was to determine if FINDER was providing additional case solvability and investigative success information compared to other law enforcement information systems.

In terms of the comparison between FINDER and non-FINDER and the information contained in each system; it may appear that the FINDER system contained greater case solvability information than non-FINDER and vice versa with investigative success information; however, these findings are ultimately inconclusive. The inconclusive findings related to the comparison are due in part to the lack of knowledge regarding the non-FINDER systems, lack of control in the distribution of surveys, and ultimately the difference in findings between case solvability and investigative success.

As more and more law enforcement agencies are looking to increase their resources and expand on their knowledge, agencies are turning to technology; specifically information sharing. As discussed previously, there has been either hesitation, unwillingness or simply the

unavailability of the means to share vital law enforcement information between law enforcement agencies. As features within the field and the law enforcement community have changed, the technology and the mindset of information sharing among agencies has also transformed and evolved over the years.

Although there is a lack of current literature on law enforcement information sharing systems as they pertain to case solvability and investigative success information, this research study has opened the door for future research. As stated in previous chapters, the research and literature pertaining to information sharing within the law enforcement field has primarily centered on the use of the systems, rather than on the information contained in the systems. While the use of an information system is important and the components and factors that entice users to utilize the system is key; it is equally important to study the results of such an information system and if the goals of the system are being accomplished. Investigators want to utilize a system that is not only functional and user-friendly, but also one that provides them with the crucial information that is necessary for them to conduct thorough investigations. There is little purpose to creating a system that does not meet the intended outcome. For law enforcement information sharing systems, the goal is to provide those investigators with the necessary information to assist in their investigations. This study explores such information and ultimately indicates that FINDER is meeting the intended purpose.

<u>Limitations of Study</u>

There is little existing literature available to guide studies related to law enforcement information sharing and the information contained in such law enforcement information sharing

systems. Therefore, this study is exploratory and has utilized the known knowledge base as it exists today. This lack of an established knowledge base does produce certain limitations.

As stated previously, this study is a cross-sectional, retrospective design. A limitation of a cross-sectional design is that the results and conclusions derived are based on one-point in time and it does not take into account future encounters that may change one's experiences and observations. This may include, but not limited to, supplementary training and additional skill utilizing the information system. In addition, law enforcement investigators were asked to recall past experiences. In this method, the law enforcement investigator may have faulty memories or even possibly inaccurately guess or lie to complete the questionnaire (Maxfield & Babbie, 2001). If and when this occurs, the extent and impact may be unknown, and therefore the information presented by the participant must be relied upon to be truthful and honest.

One limitation, due to the lack of knowledge and available studies pertaining to the topic is the questionnaire. Although current literature on the topic of case solvability and investigative success, as well as input from subject-matter experts was used; there is an absence of a validated questionnaire. The questionnaire for this study was a new development rather than one that had been previously proven in past studies. In addition, the survey administration and composition could be enhanced by using more recent literature on survey construction.

The surveys were distributed by the agency themselves and therefore created a lack of control regarding the distribution and which investigators received the survey. A further weakness and limitation of the design study pertains to the notion that the individuals selected by their agency to complete the questionnaire may be aware that they are involved in a research study and therefore their answers may be influenced. As Gliner & Morgan (2000) note, participants of a

self-reported study may influence the study in that they may not know or remember specific information, may want to please those conducting the study through their answers, or may not want to reveal specific information, behavior, etc., even though confidentiality is in place.

For this study, the population was comprised of two groups, those law enforcement investigators who utilize the FINDER system and those law enforcement investigators who do not participate in the FINDER system. According to FINDER personnel, there were approximately 9,000 – 10,000 users at the time of this study; however, this figure included all FINDER users. FINDER users included non-sworn investigative personnel (i.e. crime analysts, civilians, patrol, etc.), as well as those individuals employed by state agencies, etc. Since it was not possible to obtain a precise number that included only law enforcement investigators from the sheriff's offices, as well as the municipal police departments, the sample size may have been overestimated; however, the non-FINDER response was lower than those FINDER participants.

As noted previously in the methodology section, there are several threats that can impact the validity of a study. Of those threats mentioned, the most notable is that the participants in this study were not randomly selected and participation in the information sharing FINDER system, as well as the survey was voluntary. The individual users and participants of the FINDER system were unable to be determined, and therefore the agencies were relied upon to distribute the questionnaires to the respective investigators. In addition, those investigators that do not participate in the FINDER system noted the primary type of information system that they utilized. The system that they noted as an information system was based on their perception of an information sharing system and it is unknown if the systems contain the exact same information. Certain aspects of this study provided an exploratory purpose and a backbone for

future research on the topic of law enforcement information sharing systems and the information contained in these systems.

<u>Future Research</u>

While the results and findings of this study lend support to the research model; further studies on the topic of law enforcement information sharing pertaining to case solvability and investigative success should continue. As this study concludes, there are additional research studies that can transpire from this particular study. This research examined case solvability and investigative success and the use of FINDER, based on law enforcement's memory of their cases. A potential step in the research would be to select a sample to follow during their use of the system. This would allow the researcher to follow the investigator's case load and have the investigator's keep a log of when they use the system for a particular case, why they decided to use the system, the outcome of the case, and if it led to case solvability and/or investigative success.

This study gathered information from investigators that do not utilize the FINDER system. As the investigators noted which systems they incorporated and utilized as their primary information sharing system in the questionnaires, it may also be interesting to follow those investigators and review their primary system use, why it is the primary system, and the outcome of particular cases. A future study would group such information sharing systems to isolate and compare directly with the FINDER system for further and comparative analysis.

Summary

    This study may provide further insight and guidance on the topic of law enforcement information sharing as it relates to case solvability and investigative success. The design, implementation, and use of the law enforcement information sharing systems among agencies may either contribute to or improve the outcome of case solvability and/or investigative success. To fully understand the impact of the information system, studies must be conducted on the outcomes, rather than on just the use and implementation of the system.

    As stated and demonstrated in previous chapters, many studies have been conducted on the use of information sharing systems within the field of law enforcement; however, literature on the information contained in the system and its impact on investigative success, including the concept of case solvability is scarce. As technology is an important component in today's world, including the law enforcement field, it is important to study the outcome that the technology is attempting to achieve. In the case of information sharing in law enforcement, the goal is to share information in an effort to increase crime prevention, as well as investigative success.

APPENDIX A: IRB APPROVAL LETTER

University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Approval of Human Research

From: **UCF Institutional Review Board #1**
FWA00000351, IRB00001138

To: **Jennifer L Freeman-Walker**

Date: **July 22, 2011**

Dear Researcher:

On July 22, 2011, the IRB approved the following human participant research until 7/21/2012 inclusive:

Type of Review:	UCF Initial Review Submission Form
	Expedited Review Category #7
	This approval includes a Waiver of Written Documentation of Consent
Project Title:	Law Enforcement Information Sharing: Investigative Productivity Through the use of Florida's FINDER System
Investigator:	Jennifer L Freeman-Walker
IRB Number:	SBE-11-07556
Funding Agency:	None

The Continuing Review Application must be submitted 30days prior to the expiration date for studies that were previously expedited, and 60 days prior to the expiration date for research that was previously reviewed at a convened meeting. Do not make changes to the study (i.e., protocol, methodology, consent form, personnel, site, etc.) before obtaining IRB approval. A Modification Form **cannot** be used to extend the approval period of a study. All forms may be completed and submitted online at https://iris.research.ucf.edu .

If continuing review approval is not granted before the expiration date of 7/21/2012, approval of this research expires on that date. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

Use of the approved, stamped consent document(s) is required. The new form supersedes all previous versions, which are now invalid for further use. Only approved investigators (or other approved key study personnel) may solicit consent for research participation. Participants or their representatives must receive a copy of the consent form(s).

In the conduct of this research, you are responsible to follow the requirements of the Investigator Manual.

On behalf of Kendra Dimond Campbell, MA, JD, UCF IRB Interim Chair, this letter is signed by:

Signature applied by Janice Turchin on 07/22/2011 10:37:04 AM EDT

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IRB Coordinator

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APPENDIX B: LETTER TO FINDER AGENCIES

University of
**Central
Florida**

December 19, 2011

Dear Law Enforcement Executive:

I am writing to request your agency's participation in a study about how law enforcement information sharing impacts case solvability. Your agency uses the law enforcement sharing system known as FINDER. You probably are aware that FINDER is a collaborative effort between Florida's law enforcement community and the University of Central Florida (UCF). This study is being conducted through the College of Health and Public Affairs at UCF and is very important to more fully understand how FINDER impacts case solvability.

Your agency's experience will help develop information used for an analysis to improve FINDER and case clearances. The objective of the study is to develop new information that can be used to build better information sharing system tools for investigative use. Therefore, we would greatly appreciate your assistance by having four of your detectives who utilize FINDER complete the questionnaire.

Participation in this survey is voluntary. Any question may be omitted and you may discontinue participation at any time. All responses are confidential and that your agency will not be identified in any published materials. The results of this survey will be available upon request. There are no direct benefits or compensation to participants.

For your convenience, your detectives can response in one of two ways:

On the Web: If Internet access is available to you, we invite you to complete the questionnaire online. Please go to this website to access the questionnaire:
http://www.surveymonkey.com/s/FINDERInformationSharing

Paper: If you prefer to complete the paper version, complete and return the enclosed questionnaires in the postage-paid envelope. You are encouraged to retain copies of your completed surveys.

We would greatly appreciate your responses no later than January 31, 2012.

If you have any questions about this research, please contact Dr. Mike Reynolds, at (407) 823-2943 / Kenneth.Reynolds@ucf.edu or Jennifer Freeman-Walker at (863)860-0759 / jlfreeman78@ucf.edu. Questions or concerns about research participants' rights may be directed to the UCFIRB Office, University of Central Florida Office of Research, 12201 Research Parkway, Suite 501, Orlando, Florida 32826-3246. The phone number is (407) 823-2901.

Thank you in advance for your time and consideration.

APPENDIX C: LETTER TO NON-FINDER AGENCIES

December 19, 2011

Dear Law Enforcement Executive:

I am writing to request your agency's participation in a study about how law enforcement information sharing impacts case solvability. This study will research the use of information sharing systems by agencies compared to those agencies that utilize the information sharing system known as FINDER (Florida Integrated Network for Data Exchange and Retrieval). FINDER is a collaborative effort between Florida's law enforcement community and the University of Central Florida (UCF). This study is being conducted through the College of Health and Public Affairs at UCF and is very important to more fully understand how FINDER and additional information sharing systems impact case solvability.

Your agency's experience will help develop information used for an analysis to improve FINDER and case clearances. The objective of the study is to develop new information that can be used to build better information sharing system tools for investigative use. Therefore, we would greatly appreciate your assistance by having two of your detectives complete the questionnaire.

Participation in this survey is voluntary. Any question may be omitted and you may discontinue participation at any time. All responses are confidential and that your agency will not be identified in any published materials. The results of this survey will be available upon request. There are no direct benefits or compensation to participants.

For your convenience, your detectives can response in one of two ways:

On the Web: If Internet access is available to you, we invite you to complete the questionnaire online. Please go to this website to access the questionnaire:
http://www.surveymonkey.com/s/AgencyInformationSharing

Paper: If you prefer to complete the paper version, complete and return the enclosed questionnaires in the postage-paid envelope. You are encouraged to retain copies of your completed surveys.

We would greatly appreciate your responses no later than January 31, 2012.

If you have any questions about this research, please contact Dr. Mike Reynolds, at (407) 823-2943 / Kenneth.Reynolds@ucf.edu or Jennifer Freeman-Walker at (863)860-0759 / jlfreeman78@ucf.edu. Questions or concerns about research participants' rights may be directed to the UCFIRB Office, University of Central Florida Office of Research, 12201 Research Parkway, Suite 501, Orlando, Florida 32826-3246. The phone number is (407) 823-2901.

Thank you in advance for your time and consideration.

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APPENDIX D: FINDER QUESTIONNAIRE

Case Solvability & Florida Integrated Network for Data Exchange and Retrieval

> - Please complete as thoroughly as possible.
> - Please print as neatly as possible.
> - Please return the completed survey by January 31, 2012.

1. What type of law enforcement agency do you work for? (please check one)

☐ Police Department   ☐ Sheriff's Office   ☐ Other _____

2. What is your FINDER user name? _____

   a. If you have used a FINDER User Name(s) other than the one above, please enter it below.

   Please enter any other User Name you have used. _____

3. What is your job title? _____

4. What type of crimes do you currently investigate? (please check those that apply)

☐ Property   ☐ Sex Offenses   ☐ Robbery   ☐ Homicide   ☐ Narcotics

☐ Person   ☐ Financial   ☐ Fraud   ☐ Internet   ☐ Other _____

5. What is your average case load per month? _____

6. How many years in your current position? _____

7. How many years with your current agency? _____

8. How many years as a law enforcement investigator? _____

9. How many years as a law enforcement officer/deputy? _____

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10. Approximately, when did you begin using FINDER? (Please include the month if known. If not, then only the year).

      Month _____   Year _____

11. How often do you use FINDER for your work? (please check one)

    ☐ Almost never   ☐ A few times a month   ☐ A few times a week

    ☐ Almost every day   ☐ Every day

12. Do you have continuous access to FINDER? (please check one)

    ☐ Yes   ☐ No

13. What type of cases have you used FINDER for? (please check all that apply)

    ☐ Property   ☐ Sex Offenses   ☐ Robbery   ☐ Homicide   ☐ Narcotics

    ☐ Person   ☐ Financial   ☐ Fraud   ☐ Internet   ☐ Other _____

14. What kind of FINDER training have you received? (please check all that apply)

    ☐ A co-worker or supervisor provided my FINDER training.

    ☐ I attended a training session presented by the Law Enforcement Consortium.

    ☐ My agency provided a FINDER training class.

    ☐ I did not receive any FINDER training.

    ☐ Other _____

15. Approximately, how many hours of FINDER training did you receive? _____ hours

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Please indicate your level of agreement, or disagreement, with the following statements:

	Strongly Disagree	Somewhat Disagree	Disagree	Neither Agree or Disagree	Agree	Modestly Agree	Strongly Agree
16. FINDER enables me to accomplish my investigative tasks more quickly.	1	2	3	4	5	6	7
17. Using FINDER improves my investigative productivity.	1	2	3	4	5	6	7
18. My supervisor believes it is important to use FINDER.	1	2	3	4	5	6	7
19. My colleagues believe it is important for investigators to use FINDER.	1	2	3	4	5	6	7
20. Based on my previous experience, I would use FINDER in future investigations.	1	2	3	4	5	6	7
21. It is easy to learn how to use FINDER.	1	2	3	4	5	6	7
22. FINDER is convenient to use.	1	2	3	4	5	6	7
23. I can count on FINDER to be available when I need it.	1	2	3	4	5	6	7
24. I frequently deal with investigative problems not specifically addressed by policies and procedures.	1	2	3	4	5	6	7
25. The investigative information that I need to solve a case involves information from more than one law enforcement agency.	1	2	3	4	5	6	7

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Please indicate your level of agreement, or disagreement, with the following statements:

	Strongly Disagree	Somewhat Disagree	Disagree	Neither Agree or Disagree	Agree	Modestly Agree	Strongly Agree
26. Having the ability to easily access information from other law enforcement agencies increases my investigative efficiency.	1	2	3	4	5	6	7
27. FINDER is missing critical data that would be very useful to support investigations.	1	2	3	4	5	6	7
28. FINDER provides a detailed level of data that is helpful for investigative support.	1	2	3	4	5	6	7
29. The information provided from FINDER has been reliable.	1	2	3	4	5	6	7
30. The availability and use of FINDER has increased your ability to solve cases.	1	2	3	4	5	6	7
31. FINDER provides essential case solvability information from other Florida agencies that facilitate case success such as:							
a. Witness Information	1	2	3	4	5	6	7
b. Associate(s) Information	1	2	3	4	5	6	7
c. Weapon Information	1	2	3	4	5	6	7
d. Forensic Information	1	2	3	4	5	6	7
e. Vehicle Information	1	2	3	4	5	6	7
f. M.O. Information	1	2	3	4	5	6	7

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g.	Address Information	1	2	3	4	5	6	7
h.	Suspect(s) Information	1	2	3	4	5	6	7
i.	Victim(s) Information	1	2	3	4	5	6	7
j.	Additional Information (please explain)	1	2	3	4	5	6	7

Based on your experience, circle the number that corresponds to the percentages related to the following items:

	Up to 20%	21-40%	41-60%	61-80%	81-100%	NA
32. Percentage of your arrests that were facilitated by FINDER.	1	2	3	4	5	6
33. Percentage of property recovered that was assisted by FINDER.	1	2	3	4	5	6
34. Percentage of suspects identified that was assisted by FINDER.	1	2	3	4	5	6
35. Percentage of persons located that was assisted by FINDER.	1	2	3	4	5	6
36. Percentage of vehicles recovered that was assisted by FINDER.	1	2	3	4	5	6
37. Percentage of case leads that aided an investigation from information obtained via FINDER.	1	2	3	4	5	6
38. Percentage of FIR information obtained from FINDER that aided a case.	1	2	3	4	5	6

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Based on your experience, circle the number that corresponds to the percentages related to the following items:

	Up to 20%	21-40%	41-60%	61-80%	81-100%	NA
39. Percentage of information obtained from FINDER that provided a link to another crime/criminal.	1	2	3	4	5	6
40. Percentage of your arrests which probably would not have occurred without the use of FINDER.	1	2	3	4	5	6
41. Percentage of property you recovered (gross number) which probably would not have been recovered without the use of FINDER.	1	2	3	4	5	6
42. Percentage of suspects identified which probably would not have been identified without the use of FINDER.	1	2	3	4	5	6
43. Percentage of person(s) located which probably would not have been located without the use of FINDER.	1	2	3	4	5	6
44. Percentage of vehicles recovered which probably would not have been located without the use of FINDER.	1	2	3	4	5	6
45. Percentage of case leads that furthered an investigation that would not have been obtained without the use of FINDER.	1	2	3	4	5	6
46. Percentage of FIR information that facilitated a case that would not have been obtained without the use of FINDER.	1	2	3	4	5	6

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47. If there are follow-up questions, would you be willing to speak with the researcher regarding your survey response? (please check one)

☐ Yes   Please provide your email address _____

☐ No

Thank you for taking the time to complete this confidential survey. Your opinions and experiences are very important in helping us. You can send this survey back to us with the attached, postage-paid envelope.

If you have any additional comments or suggestions with this survey, please write them below. Also you may contact the researcher, Jennifer Freeman-Walker, directly at jlfreeman78@knights.ucf.edu. The research supervisor, Dr. Kenneth Reynolds, can be contacted at Kenneth.Reynolds@ucf.edu.

Comments:

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APPENDIX E: NON-FINDER QUESTIONNAIRE

Case Solvability & Information Sharing System

- Please complete as thoroughly as possible.
- Please print as neatly as possible.
- Please return the completed survey by January 31, 2012.

1. What type of law enforcement agency do you work for? (please check one)

☐ Police Department   ☐ Sheriff's Office   ☐ Other _____

2. What is your job title? _____

3. What type of crimes do you currently investigate? (please check those that apply)

☐ Property   ☐ Sex Offenses   ☐ Robbery   ☐ Homicide   ☐ Narcotics

☐ Person   ☐ Financial   ☐ Fraud   ☐ Internet   ☐ Other _____

4. What is your average case load per month? _____

5. How many years in your current position? _____

6. How many years with your current agency? _____

7. How many years as a law enforcement investigator? _____

8. How many years as a law enforcement officer/deputy? _____

9. What primary type of information system do you utilize when conducting investigations? _____

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10. Approximately, when did you begin using this information system? Month _____ Year _____

11. How often do you use this information system for your work? (please check one)

☐ Almost never   ☐ A few times a month   ☐ A few times a week

☐ Almost every day   ☐ Every day

12. Do you have continuous access to this information system? (please check one)

☐ Yes   ☐ No

13. What type of cases have you used this information system for? (please check all those that apply)

☐ Property   ☐ Sex Offenses   ☐ Robbery   ☐ Homicide   ☐ Narcotics

☐ Person   ☐ Financial   ☐ Fraud   ☐ Internet   ☐ Other _____

14. What kind of training did you receive for this information system? (please check all that apply)

☐ A co-worker or supervisor provided my training.

☐ My agency provided a training class.

☐ I did not receive any training.

☐ Other _____

15. Approximately, how many hours of training did you receive? _____ hours

2

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Please indicate your level of agreement, or disagreement, with the following statements pertaining to the information system you stated above:

	Strongly Disagree	Somewhat Disagree	Disagree	Neither Agree or Disagree	Agree	Modestly Agree	Strongly Agree
16. This information system enables me to accomplish my investigative tasks more quickly.	1	2	3	4	5	6	7
17. Using this information system improves my investigative productivity.	1	2	3	4	5	6	7
18. My supervisor believes it is important to use this information system.	1	2	3	4	5	6	7
19. My colleagues believe it is important for investigators to use this information system.	1	2	3	4	5	6	7
20. Based on my previous experience, I would use this information system in future investigations.	1	2	3	4	5	6	7
21. It is easy to learn how to use this information system.	1	2	3	4	5	6	7
22. This information system is convenient to use.	1	2	3	4	5	6	7
23. I can count on this information system to be available when I need it.	1	2	3	4	5	6	7
24. I frequently deal with investigative problems not specifically addressed by policies and procedures.	1	2	3	4	5	6	7
25. The investigative information that I need to solve a case involves information from more than one law enforcement agency.	1	2	3	4	5	6	7

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Please indicate your level of agreement, or disagreement, with the following statements pertaining to the information system you stated above:

	Strongly Disagree	Somewhat Disagree	Disagree	Neither Agree or Disagree	Agree	Modestly Agree	Strongly Agree
26. Having the ability to easily access information from other law enforcement agencies increases my investigative efficiency.	1	2	3	4	5	6	7
27. This information system is missing critical data that would be very useful to support investigations.	1	2	3	4	5	6	7
28. This information system provides a detailed level of data that is helpful for investigative support.	1	2	3	4	5	6	7
29. The information provided from this information system has been reliable.	1	2	3	4	5	6	7
30. The availability and use of this information system has increased your ability to solve cases.	1	2	3	4	5	6	7
31. This information system provides essential case solvability information from other Florida agencies that facilitate case success such as:							
a. Witness Information	1	2	3	4	5	6	7
b. Associate(s) Information	1	2	3	4	5	6	7
c. Weapon Information	1	2	3	4	5	6	7
d. Forensic Information	1	2	3	4	5	6	7
e. Vehicle Information	1	2	3	4	5	6	7
f. M.O. Information	1	2	3	4	5	6	7

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g.	Address Information	1	2	3	4	5	6	7
h.	Suspect Information	1	2	3	4	5	6	7
i.	Victim Information	1	2	3	4	5	6	7
j.	Additional Information (please explain)	1	2	3	4	5	6	7

Based on your experience, circle the number that corresponds to the percentages related to the following items:

	Up to 20%	21-40%	41-60%	61-80%	81-100%	NA
32. Percentage of your arrests that were facilitated by this information system.	1	2	3	4	5	6
33. Percentage of property recovered that was assisted by this information system.	1	2	3	4	5	6
34. Percentage of suspects identified that was assisted by this information system.	1	2	3	4	5	6
35. Percentage of persons located that was assisted by this information system.	1	2	3	4	5	6
36. Percentage of vehicles recovered that was assisted by this information system.	1	2	3	4	5	6
37. Percentage of case leads that aided an investigation that was assisted by this information system.	1	2	3	4	5	6
38. Percentage of FIR information obtained from this information system that aided a case.	1	2	3	4	5	6

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Based on your experience, circle the number that corresponds to the percentages related to the following items:

	Up to 20%	21-40%	41-60%	61-80%	81-100%	NA
39. Percentage of information obtained from this information system that provided a link to another crime/criminal.	1	2	3	4	5	6
40. Percentage of your arrests which probably would not have occurred without the use of this information system.	1	2	3	4	5	6
41. Percentage of property you recovered (gross number) which probably would not have been recovered without the use of this information system.	1	2	3	4	5	6
42. Percentage of suspects identified which probably would not have been identified without the use of this information system.	1	2	3	4	5	6
43. Percentage of person(s) located which probably would not have been located without the use of this information system.	1	2	3	4	5	6
44. Percentage of vehicles recovered which probably would not have been located without the use of this information system.	1	2	3	4	5	6
45. Percentage of case leads that furthered an investigation that would not have been obtained without the use of this information system.	1	2	3	4	5	6
46. Percentage of FIR information that facilitated a case that would not have been obtained without the use of this information system.	1	2	3	4	5	6

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47. If there are follow-up questions, would you be willing to speak with the researcher regarding your survey response? (Please check one)

☐ Yes   Please provide your email address _____

☐ No

Thank you for taking the time to complete this confidential survey. Your opinions and experiences are very important in helping us. You can send this survey back to us with the attached, postage-paid envelope.

If you have any additional comments or suggestions with this survey, please write them below. Also you may contact the researcher, Jennifer Freeman-Walker, directly at jlfreeman78@knights.ucf.edu. The research supervisor, Dr. Kenneth Reynolds, can be contacted at Kenneth.Reynolds@ucf.edu.

Comments:

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