

KNOWLEDGE MANAGEMENT AND LAW ENFORCEMENT: AN EXAMINATION OF  
KNOWLEDGE MANAGEMENT STRATEGIES OF THE POLICE INFORMATION  
SYSTEM (POLNET) IN THE TURKISH NATIONAL POLICE

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This research study explores knowledge management (KM) in law enforcement, focusing on the POLNET system established by the Turkish National Police as a knowledge-sharing tool. This study employs a qualitative case study for exploratory and descriptive purposes. The qualitative data set came from semi-structured face-to-face and telephone interviews, as well as self-administered e-mail questionnaires. The sample was composed of police administrators who created POLNET, working under the Department of Information Technologies and the Department of Communication. A content analysis method is used to analyze the data.

This study finds that law enforcement organizations' KM strategies have several differences from Handzic and Zhou's integrated KM model. Especially, organizational culture and structure of law enforcement agencies differently affect knowledge creation, conversion, retrieval, and sharing processes. Accordingly, this study offers a new model which is dynamic and suggests that outcomes always affect drivers.

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## CHAPTER 1

### INTRODUCTION TO THE STUDY

#### 1.1 General Description of the Area of Concern

Life begins with information. In fact, “information is responsible for all life on Earth” (Seife, 2006, p. 89). Everything in the universe has to obey information laws because information lies in every living organism. However, it is not living beings alone that process information. Every particle in the universe, from electrons to atoms, is full of information. That information is constantly moving through space. Therefore, to understand what life is, people have to correctly interpret information (Seife, 2006).

Human beings, as the most complex creatures, also interact with information from the beginning to the end of life. Informing and being informed must continue for a person to become knowledgeable throughout life. Allen (1996) has agreed “I know because I have learned. I have learned, frequently, because I have been informed. At the same time, I am able to inform someone, because I know something. The process of knowing, learning, informing, and being informed are inextricable bound up with each other” (p. 3). Together with knowing, learning and informing, the world has become a knowledge-based society in which all kinds of information has been produced, linked together, and retrieved easily and quickly by information seekers.

Increasing trends in information and communication technologies have brought new evolution to information access and sharing. During the industrial age, technology usage was limited. Communication was based on face to face or paper-based interactions, and experience and knowledge were tangible and immediate (Miller, 2002). With the integration of computers in our lives, a new time period has begun: the information age or information era (Handzic, 2004). In this new era, the style of retrieving and sharing information has changed. We can reach a wide variety of information through informational sources, such as the World Wide Web, emails, images, etc. (Burgin, 2003).

The information age (knowledge-based age, knowledge economy, and knowledge society are also used in place of the information age) is formed by globalization based on competition, virtualization, or digitalization facilitated by information technology, as well as the transformation to a knowledge-based economy. Regardless of nomenclature, all terminologies include changes in the business environment (Handzic, 2004).

Organizations are trying to keep up with a changing world. However, becoming a knowledge-based organization depends on how many successful knowledge workers an organization has, and how successfully, productively, and efficiently current knowledge is used throughout the organization. This brings about a new term, Knowledge Management (KM), which indicates utilizing knowledge in different ways in order to achieve organizational goals.

Knowledge Management is the process by which organizations can find, organize, and share what they know. Through KM, organizations benefit from problem solving, dynamic learning, and decision making activities (Gupta, Iyer, & Aronson, 2000). The goal of organizations that have adopted KM strategies are to maximize the business value of intellectual assets, increase their performance, and establish a new culture that leads to coming improvements (Lloyd, 1996).

In the business community, the importance of knowledge and managing knowledge is greatly understood. However, there is no agreement among researchers and practitioners about what forms useful knowledge and how this knowledge should be effectively managed. Many organizations have adopted different kinds of KM strategies, but none of them are inclusive (Holsapple & Joshi, 1999). There is no agreement whether knowledge should be considered a technical issue, a human resource issue, or a part of the procedure of management. Different approaches to implement KM show that KM frameworks should include wide range of issues, methods, and theories (Handzic, 2004). To overcome this complexity, Handzic and Zhou (2005) offer the driver-enabler-process-knowledge-outcome model adopted from Handzic's (2004) earlier work. This integrated model covers all parts of the KM and links between those parts.

Similar to business organizations, the public sector is turning to the knowledge environment (Luen & Al-Hawamdeh, 2001; Schultz, 2000). Since KM increases organizational performance by creating, organizing, and utilizing knowledge effectively and efficiently, the implementations of KM processes are

also very important for police work, the most knowledge-intensive government organization (Collier, 2006).

The nature of police work is dynamic, complex, stressful, and exceedingly different than any other government organization. In their daily activities, police officers deal with numerous problems including preventing crime; handling serious violent crimes, disorder, and anti-social behaviors; managing incidents; investigating; and community policing (Collier, 2006; Luen & Al-Hawamdeh, 2001).

The development of information technologies and the adaptation of these technologies by police organizations have facilitated KM activities for the police (Hauck, Chau, & Chen, 2002). In the frame of KM, the Turkish National Police (TNP) has established a police computer network and information system, known as POLNET, to enable knowledge repository, retrieval, and sharing processes. This system provides access to all necessary information related to police duty from anywhere, at anytime, and as quickly and securely as possible.

This study aims to discover if the KM strategies of POLNET are compatible with the driver-enabler-process-knowledge-outcome (Handzic & Zhou, 2005) model.

## 1.2 Problem to be Studied

In today's economy, many organizations create and use knowledge (Nonaka, 1991). The development of technological advances and the adoption of

many KM strategies facilitate creating, retrieving, and sharing knowledge throughout an organization.

The basic reason why knowledge should be managed is to achieve process and product improvements, increase decision making, and make adaptation easy to new changes for the organization (Handzic, 2004). There are many KM strategies that organizations adopt (Nonaka, 1994). However, how these strategies are handled in the organization is important. The more crucial point is whether the organization's KM achieves its target, increases organization success and capacity, and makes a positive contribution to decision-making procedures.

In the scope of police work, there are two different kinds of knowledge that need to be managed. The first type of knowledge is tacit knowledge, or what people know. This includes the experience and skill of police officers. Regarding tacit knowledge, KM includes two areas: creating knowledge and sharing knowledge. Both these two management areas depend on the willingness and the ability of police officers. The organizational environment in this state plays an important role. The willingness of police officers to create and share knowledge increases in a "culture of openness, collaboration and sharing" (Luen & Al-Hawadeh, 2001, p. 314). Only this can break the general "I am more senior, thus, I know better" mentality coming from the rigid rank structure of a police organization. In addition to willingness, the ability of police officers to create and share knowledge with their peers should also be increased. For this purpose,



training and redesign of workflow and workplaces facilitate knowledge sharing and collaborating among police officers.

The second type of knowledge is explicit knowledge. It is captured from documents such as procedures of arrest or reports of scene investigations (Luen and Al-Hawadeh, 2001). Explicit knowledge is very important for an organization because it codifies past learning and rules, it coordinates different information, and it expresses technical skills and rules which help the organization to present itself. Explicit knowledge can be managed easily by using computer databases, software programs, photographs, or films (Choo, 2000). In managing explicit knowledge, the following steps can be used: (1) identification, analysis, and selection, (2) capturing and documenting, (3) retrieving, (4) storing and accessing, and (5) updating knowledge (Luen & Al-Hawadeh, 2001).

Because of membership in the Turkish National Police, in this dissertation I work on knowledge management strategies of the POLNET system that TNP has adopted as a knowledge-sharing tool. POLNET is an intranet system that allows knowledge transferring among all police departments in Turkey. The intention is to establish an internal information network among different departments such as security, terror and traffic, and external information networks among other government organizations such as National Intelligence Organization, Ministry of Defense and Ministry of Justice. Today, the POLNET system is used by 33,000 users with 13,567 workstations in 81 cities' central police departments and many counties' police departments by performing around

2.5 million processes each day (Yalcinkaya, 2007). The POLNET system not only allows data storing and transferring, but also enables audio, images, and videos to be shared.

Establishing and using POLNET requires both tacit and explicit knowledge management. Even though there are some studies about POLNET regarding information technology utilization (Pekgozlu, 2003), technology acceptance (Yalcinkaya, 2007), and e-learning and in-service training practices in TNP (Zengin, 2007), this system has not been researched from the perspective of KM issues. Thus, this study aims to close that gap by deeply examining KM issues in TNP by exploring POLNET.

### 1.3 Purpose of the Research Project

Parallel to stated problems, the primary objective of this research is to answer the research questions. Answers of the questions lead the study to understand if the POLNET model matches with an integrated KM framework (Handzic & Zhou, 2005), and to help offer new KM model for POLNET. To support of this main objective, the first purpose of this study is to expose differences between the terms data, information, and knowledge. The second purpose is to look into an integrated knowledge management approach (Handzic & Zhou, 2005) allowing for a better understanding KM strategies in organizations. To reveal KM strategies of POLNET in TNP is the third objective of this research study. Under this perspective, drivers which trigger the POLNET project; organizational environment such as culture, leadership and structure features in

TNP; technological infrastructure of the POLNET system; KM processes such as creation, storage, and sharing knowledge through POLNET; and outcomes of the system will be handled deeply in coming chapters.

#### 1.4 Major Research Question

This study is looking for the answer of following major question: Do KM strategies of TNP match with KM integrated model that Handzic and Zhou (2005) have offered?

#### 1.5 Supporting Research Questions

In addition to a major question, minor questions mentioned below are also intended to be responded to help answer the major question.

- A. Which drivers trigger the POLNET project?
- B. Do organizational culture, structure, and leadership features affect the POLNET system?
- C. What is the technological infrastructure of the POLNET system?
- D. What are the KM processes of the POLNET?
  - Knowledge creation process,
  - Knowledge storage/retrieval process
  - Knowledge sharing/transfer process
- E. Do outcomes of the POLNET system affect drivers?

#### 1.6 Significance of the Study

Knowledge management is not a new term. Under the different names such as the repertory grid, organizational learning, or organizational

development, organizations have implemented knowledge management issues since beginning of the 1900s (T. D. Wilson, 2002). Even though the concept of 'knowledge management' has been debated by some scholars as being another fad (T. D. Wilson, 2002), it is, significantly, being considered as an umbrella covering many multidisciplinary fields, such as system engineering, organizational learning, and decision support; and research shows that the success and productivity of organizations depends on how they manage what they have (Ponzi & Koenig, 2002).

Some major organizations hire chief knowledge officers and chief learning officers to initiate and apply knowledge management activity throughout the company. On the other hand, many others are still struggling to understand the general concept of the issue because of confusion arose from too many and different KM frameworks (Holsapple & Joshi, 1999). The integrated framework of KM offered by Handzic and Zhou (2005) can be considered as a solution for this confusion.

In this research study, the integrated framework of KM is deeply discussed. This framework does not look at only from the perspective of information technologies or intellectual capital. Additionally, it gives a more comprehensive framework that covers many aspects of management of tacit and explicit knowledge in the organization. For this reason, having this model for this study enables readers, first, grasp general concept of KM issue. Second, because of the organizational context of this study, how police culture, structure

and the role of the leadership affect knowledge management in TNP gives readers another standpoint about the subject.

## CHAPTER 2

### REVIEW OF THE LITERATURE

#### 2.1 Introduction

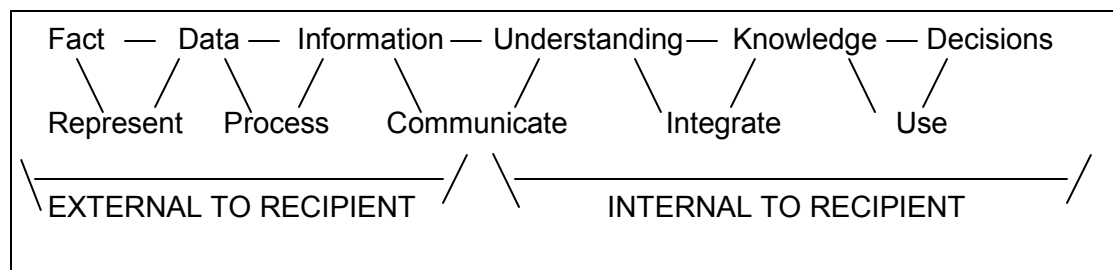
This chapter includes a review of the literature relevant to this research study. The literature review in this chapter focuses on, first, definitions of most familiar terms related to this study focusing on data, information, and knowledge; second, knowledge management strategies that organizations adopted; third, knowledge management strategies in law enforcement agencies in the United States, Germany, Australia, and Canada; and fourth, information about the POLNET system.

#### 2.2 Definitions of Terms

This section reviews a wide spectrum of literature to define the basic terms and understand different meanings, explanations, and usages of these terms that are important in comprehending the main idea of this study. Even though there are few terms discussed data, information, and knowledge are satisfactory for the study; several other terms such as fact, representation, process, communicate, recipient, and understanding, are briefly mentioned in similar context.

Scholars who are in information science and information studies areas (Blair, 2002; Buckland, 1991; Burgin, 2003; Davenport & Prusak, 2000; Hayes,

1993; O'Connor, 1996; Sveiby, 1997; T. D. Wilson, 2006) agree that it is not possible to give one simple definition and make clear distinctions between these terms. Definitions are numerous and depended on which discipline is being discussed (Bouthillier & Shearer, 2002). Ambiguity also emerges when these terms are used in substitution. However, it is necessary to draw the boundaries even though they are not certain and solid. Figure 2.1, presented by Hayes (1993), shows relationships among terms mentioned in this dissertation.



*Figure 2.1.* Schematic of relationships among terms (Hayes, 1993).

Accordingly, observed aspects of phenomena (facts) are represented as data. Data is processed to produce information. People communicate the information to the recipient. All of these aspects are external to the recipient. At the end of the communication, changes in understanding provide knowledge to the recipient. The recipient uses that knowledge for making decisions (Hayes, 1993).

### 2.2.1 Fact

Hayes (1993) defines the term fact as “a statement whose truth is testable,” meaning “verifiable truth” that refers to real world (p. 1). In this definition two problems emerge. The first is precision. According to Hayes’s example, it is a fact that the population of the United States is a specific number – say 256,123,456. However, one may not be confident with this number and prefer saying it in a confident statement, “It is a fact that the population of the United States in July 1990 is between 250 million and 260 million.”

Another problem is that statement of “it is a fact that the population of the United States is 256,123,456” does not mean that this “fact statement” is true. This statement only implies that its truth is verifiable. Additionally, even though facts attempt to represent the real world, this representation is partial and incomplete. Even though facts gather, a massive accumulation cannot truly represent the all parts of the real world. At best, a fact or an accumulation of facts may represent the real world in a particular perspective and for a particular intention.

### 2.2.2 Data

Data is one of the three central terms in this discussion. Compared to information and knowledge, data is the easiest term to describe. O’Connor (1996) defines data as “beginning of the progression ... input which has not been evaluated or given a context” (p. 7). Without a context, a thermometer reading of 37 degrees does not give any meaning. Data doesn’t say where this temperature



occurred, which scale was used to measure, or whether it is warmer, colder, or the same as recent temperatures.

Blair's (2002) definition of data is that "they are simply facts and figures that are meaningful in some way" (p. 1019). Similarly, Davenport and Prusak (2000) state that data are facts about events. They do not say anything about the importance of data. It is not judgmental or interpretive. For example, when the customer makes a transaction at a gas station, outcomes only show how many gallons he bought and how much he paid. The data does not tell whether the gas station is good or bad, or the customer's satisfaction.

Hayes (1993), on the other hand, asserts that data are not facts. As indicated earlier, facts partly represent the real world. Data, however, need not to be derived from the real world. All imagination products may also be considered as data. Hayes defines data as "recorded symbols" (p. 2). In this definition, recorded symbols are taken as "primitive" (p. 2). Recorded symbols can be any printed characters, spoken words, visual images, financial accounts, or DNA and RNA protein molecules. Briefly, data as recorded symbols can be a "thing in itself," without any necessities for referring to the real-world (Hayes, 1993, p. 2).

### 2.2.3 Representation

Figure 1, schematic of relationships among terms, shows that data represent facts for the purpose of recording them. From this perspective, the reality goes two steps further: facts represent the real world and data represent those facts. Even though a fact might exactly represent a part of the real world, it

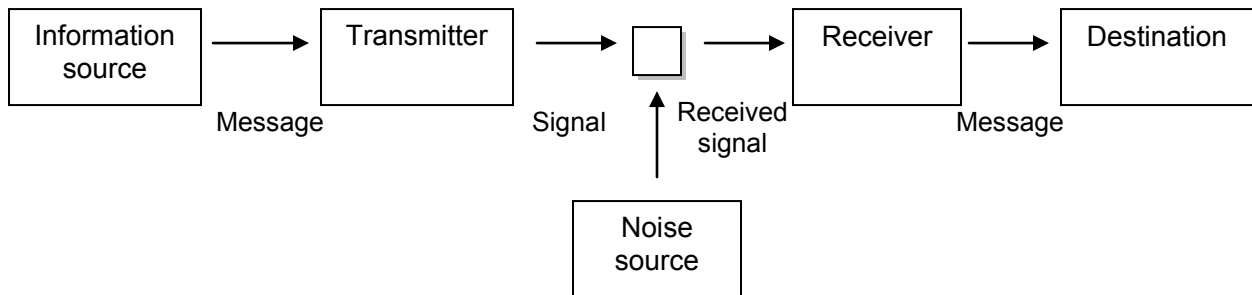
doesn't mean that data also represent a fact, indirectly a part of real world, without a loss in precision. The reason is the limited means of recordable data.

#### 2.2.4 Information

Information is another core term elaborately discussed in this dissertation. The term 'information' is defined by different perspectives because the meaning of this term changes according to the discipline and context in which the term is used. The difficulty of defining this term also comes from being used with other terms such as fact, data, and knowledge instead of the term, information (Burgin, 2003; T. D. Wilson, 2006).

The concept of information is not new. In 1949, Claude E. Shannon and Warren Weaver propounded the theory of information, also known as the mathematical theory of communication, based on the transmission of information, mainly measuring how much information is transmitted in a given message. This model has become a building stone of human communication studies. Shannon and Weaver's goal was to identify how quickly and efficiently communication messages could be transmitted from sender to receiver via electronic signals.

In this theory, all communication systems comprise several vital elements: (1) information source (message sender), (2) message (information), (3) transmitter, (4) channel, (5) message receiver, and (6) destination. Figure 2.2, submitted by Shannon and Weaver (1949), represents relationships between these parties.



*Figure 2.2.* Mathematical (information) model of communication (Shannon and Weaver, 1949).

Shannon and Weaver (1949) state that the information source produces a message or sequence of messages to send to and communicate with a message receiver. The selected message might be verbal, written, or visual materials, or combinations of those materials. A transmitter creates the signals of selected messages according to the types of channels. Signals are kinds of codes that enable messages to turn into suitable forms for transmission over the channel. So, the transmitter works as an encoder. The duty of the transmitter is to take the messages and put them in correct forms to be translated through the channel. The channel is used to convey the encoded messages from the transmitter to the receiver. For the original work of Shannon and Weaver, channel could be a pair of wires, cable, a beam of light, or radio frequencies. In general communication studies, the channel also may be air or water where the message can be translated easily. For example, “in oral speech, the information source is the brain, the transmitter is the voice mechanism producing the varying sound pressure (the signal) which is transmitted through the air (the channel)” (Shannon

& Weaver, 1949, p. 98). The receiver acts as a decoder which restructures the signal, converted into suitable forms by the transmitter, to meaningful messages to be understood. Finally, for completing communication, there must be a destination, a person (or thing) to whom the message is sent.

Shannon and Weaver mention another factor: 'noise' in the received signals. Noise refers to any distraction which prevents a message to be transmitted in the channel and creates communication problems. Noises cause three types of problems: technical, semantic, and effectiveness problems. Psychological noises may be audible or visible, such as a loud sound during conversation, interference on a TV, or mist inside a car's windshield. These kinds of noises create technical problems. Semantic noises result from using different codes between sender and receiver, indicating the wrong message and wrong attitudes toward the sender and the message.

Hancerli (2008) gives an example of how noises result in problems in communication. The first example is related to a technical problem: 'I was riding as a passenger in a car with my friend Alex driving. We were listening to loud music on the radio. Suddenly from my side of the car, a child began running into the street. I said 'STOP,' but the music kept Alex from hearing me.' In this situation, the symbols could not be transmitted precisely. The following is an example of a semantic problem in the same situation: "I was riding in the car with my friend Alex driving. We were having a conversation, so the radio was not on. A child started to run into the street. I shouted 'DUR!' which means 'stop' in

Turkish, but Alex did not stop because he is an American and does not understand the Turkish language.” The word ‘dur’ was appropriate for the speaker’s context but not for Alex’s context. The following is an example of the effectiveness problem in the same situation: “I yelled ‘STOP,’ but instead of stopping, Alex pulled the car over to the side of the road.” In this situation, the word, or symbol, was accurately transmitted and conveyed the desired meaning, but the received meaning did not affect Alex’s conduct in the desired way (Hancerli, 2008, p. 85).

Shannon and Weaver’s (1949) definition is tied to a specific measure. Formal definitions that have been generalized from Shannon and Weaver’s (1949) definition may give a more broad understanding about information. For example, Allen (1996) defined information, in the context of user studies research, as “the process in which an informant’s cognitive structures are encoded and transmitted to an information seeker, who receives the coded messages, interprets them, and learns from them” (p. 3). Therefore, information is (1) a process (informing) which is an activity both informant and user should accomplish, and (2) a kind of message (news) (Allen, 1996; Case, 2002). Indeed, information is an activity according to the informant and is a process for the user. Through information, people can learn, gain new knowledge, and inform others.

Looking from the information science perspective, Buckland (1991) used three meanings of information: information-as-process, information-as-knowledge, and information-as-thing. When people are informed, their

knowledge changes according to incoming information. In this sense, information is a process—an act of informing. Information-as-knowledge is more complicated to explain because knowledge is a word used in place of information; it can be defined as the process of knowing (learning). Information-as-thing is any expression, description, or representation that refers to objects such as data, books, and documents. Additionally, it is also related to information systems, including information retrieval systems because those systems deal directly with either storing or retrieving information. Information-as-thing is also considered evidence in the learning process because what anybody sees, hears, reads, or experiences affects their knowledge. All the materials, including information such as textbooks, commentaries, photographs, or reports, refer to information-as-thing, as well as evidence which could change one's knowledge or beliefs.

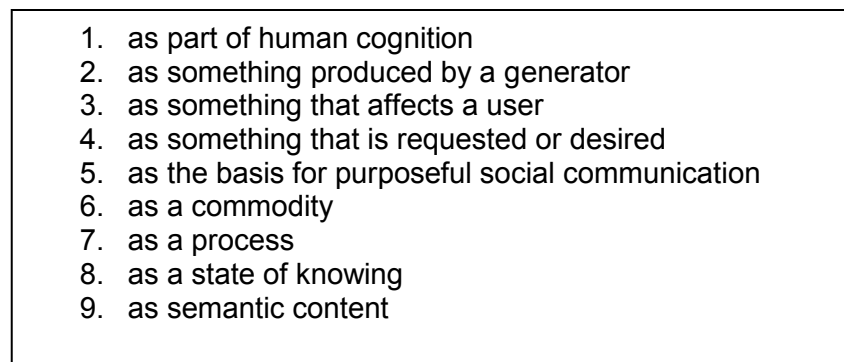
The definitions of Allen (1996) and Buckland (1991), however, have several ambiguities. Similar to the uncertainty of the term 'information,' other terms such as 'informed' or 'becoming informed' have no clear definition (Hayes, 1993). Burgin (2003) also has not accepted that the message is information itself because it can inform some people while it has no meanings for others as is given in the example: a reviewed paper in mathematics is presented to three people. The first person is a high level mathematician (A), the second is a mathematics major (B), and the third has no mathematic background, (C). All three people read the reviewed paper which is in the field of A. This paper has no any information for C because he has no understanding of mathematics.

However, there is a bulk of information for B who has some understanding of the subject and learns more from the paper. On the other hand, this paper contains little information for A because he already knows what is presented in the paper.

Burghin (2003) asserted the following statements to define information in a wide spectrum: (1) Information in general should be separated from information for a system, the system is the receiver of the information, and the quantity of information depends on the system (the receiver). For example, any book written in Japanese may contain a lot of information for those who know Japanese, but has no information for a person who does not know Japanese. Similarly, any mathematic textbook gives a bulk of information to a mathematic student but not to an expert mathematician. He can say that he knows all of these issues and there is no further information for him. (2) Information is an essence which causes change on the system (the receiver). This kind of information is called cognitive information. (3) Information is carried by three kinds of carriers: material, mental, and structural. For example, a book is a material carrier for information. On the other hand, it would not be a book without printed text, so text is the structural carrier of information. If this text gives some knowledge, this knowledge is considered the mental carrier of information. (4) There are two ways of information transaction: transmission and extraction. Therefore, the receiver receives information by two methods. Either the carrier translates information to the receiver (transmission), or the receiver extracts information from carrier through a channel (extraction). (5) The receiver accepts information

only if similar information has been translated. For example, if someone's knowledge remains after reading a piece of information, it means that that person does not accept cognitive information. (6) Same carrier can include a different portion of information for the same receiver. For example, a book written in Japanese (carrier) does not contain any information for receiver who does not know Japanese. However, the same receiver finds lots of information in the same book after learning Japanese.

Perhaps Belkin's (1978) range of information concepts gives the most comprehensive revision of information together with other concepts embodied in this term (see figure 2.3).

- 
1. as part of human cognition
  2. as something produced by a generator
  3. as something that affects a user
  4. as something that is requested or desired
  5. as the basis for purposeful social communication
  6. as a commodity
  7. as a process
  8. as a state of knowing
  9. as semantic content

*Figure 2.3.* Belkin's range of information concepts (Hayes, 1993).

#### 2.2.5 Process

Information depends on the processing of data. Hayes (1993) identifies four levels of data processing: transfer, selection, analysis, and reduction. Data transferring occurs if any material containing data is given to someone else by copying or sending through a telephone line. After this processing, the recipient



receives some level of information. Data selection includes the process of identification and retrieval of relevant data from the file. This level also compromises data transmission because the recipient receives relevant data after the process. Data analysis is putting data into a format or structure. As a result of this process, the recipient receives information with the relationships shown in which format data are placed. Data reduction means the replacement of a significant amount of data by equations. As a result, the recipient receives information that a massive amount of data has been replaced by new parameters. Figure 2.4 summarizes all levels of data processing.

1. Data Transfer (i.e., communication in a technical sense)
2. Data Selection (i.e., retrieval from a file)
3. Data Analysis (i.e., sequencing and formatting)
4. Data Reduction (i.e., replacement of data by a surrogate)

*Figure 2.4. Level of data processing (Hayes, 1993).*

#### 2.2.6 Communicate

This term is as ambiguous as information. The dictionary definition is the “exchange of thoughts, messages, or information, as by speech, signals, writing, or behavior” (American Heritage Dictionary). Generally, it is used to represent a process (Hayes, 1993).

#### 2.2.7 Understanding

If the result of communication produces any meaning for the recipient, it means that the process of communication has been understood. Understanding

refers to an internal process. For example, if the transferred data is the letter 'A,' and, according to an internal code, the recipient ascribes this data as "Alarm! Danger! Leave immediately!", the message would be understood. If transmitted data had not been understood by the recipient, the process of communication would have continued between the source and recipient until there was understanding (Hayes, 1993).

#### 2.2.8 Knowledge

Another core term of this dissertation is knowledge. Knowledge can be shortly defined as what people know (Miller, 2002). Knowledge exists within people. It is a mix of experience, values, beliefs, and information. This combination allows people to evaluate and incorporate new information and experiences. If people say someone is a "knowledgeable individual," it means they have information structured with his/her intelligence, intuition, and experiences (Davenport & Prusak, 2000).

Information and knowledge are related, but they are two different expressions. With the information age, our knowledge is not as explicitly tangible; it is the form of information combined with experience, context, beliefs, thoughts, and emotions (Denning, 2004).

Miller (2002) has said that everything we say and do, everything we read and write, every message we receive and send, is information; it has not, however, any intrinsic meaning. If so, how does information make any change to a receiver's knowledge? The answer is hidden within human interpretation.

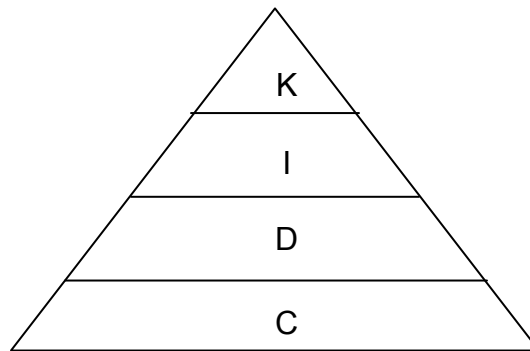
Information exists on computer screens, in any written materials, voices, movies, memos and all of them have different meanings according to interpretation (people). Therefore, the same information is construed differently in accordance with the receivers' beliefs, feelings, interest, and motivation. In short, information provides different meanings to different people in different ways (Miller, 2002).

R. M. S. Wilson (2003) presented the idea that the transformation from data to information and from information to knowledge happens through some methods. Accordingly, when data is contextualized, categorized, calculated, corrected, and condensed, it becomes information. This information turns into knowledge when comparison, consequences, connections, and conversation happen. All of those criteria are given by R. M. S. Wilson (2003, p. 160) as:

- Contextualized (C1) – we know for what purpose the data was gathered;
- Categorized (C2) – we know the units of analysis or key components of the data;
- Calculated (C3) – the data may have been analyzed mathematically or statistically;
- Corrected (C4) – errors have been removed from the data;
- Condensed (C5) – the data may have been summarized; or,  
 $D (\text{data}) + C1 + C2 + C3 + C4 + C5 = I (\text{information})$
- Comparison (C1) – how does information about this situation compare to others we have known?

- Consequences (C2) – what implications does the information have for decisions and actions?
  - Connections (C3) – how does this bit of knowledge relate to others?
  - Conversation (C4) what do other people think about this information? or,
- $$I + C1 + C2 + C3 + C4 = K \text{ (knowledge)}$$

Figure 2.5 shows relationships between data, information and knowledge.



*Figure 2.5. Pyramid model (Wilson, 2003).*

In conclusion, knowledge results from the understanding of information combined with prior information. Thus, information can be received externally while knowledge cannot. However, knowledge is created internally (Hayes, 1993).

### 2.2.9 Tacit and Explicit Knowledge in the Organizational Context

Tacit knowledge is what people know. It is any information which is constituted by our mental model, beliefs, and perspectives. Tacit knowledge shapes how we perceive the world around us. It is informal, so formalizing,

expressing, and communicating it to others is not as easy as explicit knowledge (Nonaka, 1991). Therefore, we do not clearly articulate what we know because tacit knowledge is personal and words are not enough to express all we know (Polanyi, 1967). Even though Nonaka (1991) asserted that tacit knowledge can be converted to explicit knowledge through externalizing or codifying, and transferred through observation or socialization, he also accepted that “to convert tacit knowledge into explicit knowledge means finding a way to express the inexpressible” (p. 99). Tacit knowledge comprises both cognitive and technical elements. Cognitive elements are related to individuals’ paradigms, beliefs, and viewpoints that help individuals to form their world. The technical elements of tacit knowledge, in contrast, focus on individuals’ skills which have an important role in specific contexts (Nonaka, 1994).

In organizations, people use their tacit knowledge to accomplish their work and fulfill their duties. This knowledge is gained through experiencing and doing work, and developing feeling and intuitive judgments about the situation. For example, tacit knowledge may be the technician who understands a problem with a machine according to voice coming from that machine. Because the fact that tacit knowledge is personal and experimental knowledge, it is difficult to be codified, written down, or put in any form to share with others. However, tacit knowledge can be transferred through observation, imitation of masters, and face-to-face interaction (Choo, 2000).

Explicit knowledge, unlike tacit knowledge, is formal and systematic. Therefore, communicating and sharing occurs easily with explicit knowledge through product specifications, scientific formulas, or computer programs (Nonaka, 1991). Explicit knowledge comes in two types: object-based and rule-based. If knowledge is found in any computer databases, software programs, photographs, or films, it is called object-base knowledge. Knowledge is rule-based when it is represented by symbols such as words, numbers, or models. Explicit knowledge is very important for an organization because (1) it codifies past learning and rules; (2) it coordinates different information; and (3) it expresses technical skills and rules which help the organization to present itself (Choo, 2000).

In short, tacit knowledge has personal beliefs which are difficult to reveal, formalize, and communicate, while explicit knowledge is transmissible and can be communicated in formal language.

Choo (2000) included the third kind of knowledge, cultural knowledge, in the organizational context along with tacit and explicit knowledge. An organization's beliefs based on experience, observation, self-image, and environment constitute an organization's cultural knowledge. Cultural knowledge answers such questions as "what kind of organization are we?", "what knowledge would be valuable to the organization?" and "what knowledge would be worth pursuing?" (p. 396).

### 2.2.10 Use of Data, Information and Knowledge in this Study

Discussions show that data, information, and knowledge are three of the most important terms. These terms are defined and interpreted differently according to which area they are applied. This study has chosen a semi-military organization, the police, as a research field. Therefore, it is important to note how these terms are understood and used in the frame of this organizational context.

In an organizational context, data is recorded documents for business which are stored in some technological system. Blair's (2002) definition of data is that "they are simply facts and figures that are meaningful in some way" (p. 1019). Data are crucial elements for organizations in managing their companies. Account balances, demographic statistics, or names and addresses are typical items of data. When data has been organized for particular purposes, it becomes information (Drucker, 1998).

In the police organization, data is any recorded entry that is necessary for the police to either pursue criminals or serve the public. Any single part of written reports about traffic accidents or scene investigations, such as crime time or location, is an example of data that are used in policing. If collected data is organized for a particular purpose, it turns into information. For example, if an officer brings all crime data together in a list to fully understand the incident, the list is considered information. Any incident report (information) may include crime type, location, time, and other specific information.

Knowledge, unlike data and information, is a more elusive concept to define. According to the discussions above, knowledge is internal process; if information is merged into an individual's experience, it becomes knowledge. However, not all information turns into knowledge. It depends on background of the individual. For example, a new crime scene report may give new information, and later, provide knowledge for naïve detective, but a professional detective does not gain new knowledge as a result of processing the same report.

As Blair (2002) discusses, the use of the term "knowledge" is different than data and information (e.g., put the data on the desk, put the information on the desk, or put knowledge on the desk). Therefore, knowledge is not a tangible object like data and information.

As a result, in this dissertation, data refers to any fact and figure stored in a paper or electronic database; information refers to purposive data accumulation, again stored in any report or database; and knowledge refers to internal personal understanding.

The following section discusses what knowledge management is, why managing knowledge is important for organizations, and knowledge management strategies that organizations adopted in the frame of the integrated knowledge management model suggested by Handzic and Zhou (2005).



### 2.3 Knowledge Management (KM)

Recently, knowledge management (KM) has become one of the most important and most popular topics among both academic and organization managers.

In the organizational context, KM is an emerging concern for many business and government organizations. Defining KM is as difficult as defining terms like knowledge and information. Even though there is no common agreement on approaches of KM (Broadbent, 1998; Denning, 2004; Lueg, 2001; Wiig, 1997), several thoughts have been asserted.

Gupta, Iyer, and Aronson (2000) describe two major trends in KM. They are, “(1) measuring the intellectual capital of an organization: developing measurement ratios/indexes and benchmarks; (2) knowledge mapping: capturing knowledge gained by individual and disseminating it throughout the organization, mainly via information technology” (p. 18).

Boersma and Stegwee (1996) first mention four forms of knowledge: (1) Human knowledge gained through education, training, observation, and experience is necessary for different types of operational tasks. Human knowledge can be in explicit and tacit forms. (2) Mechanized knowledge is used for specific tasks. It has been stored in a machine and available for daily operations of the organization. (3) Documented knowledge has been stored in books, documents, archives, etc. It is not used for daily tasks but always available and easy to access. (4) Automated knowledge is used to support

specific tasks as decision support systems. It is found electronically such as in information, expert, or knowledge-based systems. The aim of KM is to bring these four forms of knowledge together through three different functions:

1. Asset management: the measurement of available knowledge, distribution of knowledge, and storage of knowledge. The basic instruments for asset management are knowledge mapping and knowledge representation.
2. Access management: the aim of access management is to improve the accessibility and deployment of knowledge. For this purpose, access management analysis is knowledge for intensive tasks and can transform one type of knowledge to another one that is more applicable to supporting operational tasks.
3. Accrue knowledge: is about creation and development of new knowledge. Through hiring new people, training, creative thinking, and disseminating the knowledge within the organization, new knowledge has been created and developed.

A study conducted by Davenport, De Long, and Beers (1998) about the KM projects of 24 companies reveals four types of objectives of KM activities: “create knowledge repositories, improve knowledge access, enhance knowledge environment, and manage knowledge as an asset” (p. 44). The goal of the creating knowledge repositories is to gather knowledge documents such as memos, reports, and articles, and store them in a repository, allowing them to be retrieved by others. The goal of the second type of KM objective—improve

knowledge access—is to provide access to knowledge and allow individuals to share knowledge. The third type of KM objective—enhance knowledge environment—establishes an environment where effective knowledge creation, and where sharing and using knowledge can occur. Organizations consider knowledge an asset like any other.

Earl (2001) states three types of KM strategies or schools of thought. These are (1) technocratic, (2) economic, and (3) behavioral. The technocratic school of KM is related to knowledge, information and communication-based technologies. This school consists of three categories: the systems, cartographic, and engineering schools. In the system schools, the tacit knowledge of a human is made explicit and stored in knowledge-based systems so that other workers can reach that knowledge easily. The cartographic school is related to mapping organizational knowledge. It aims to make knowledgeable people accessible for others through recording and disclosing “who in the organization knows what” by establishing knowledge directories, called “yellow pages” (p. 220). The engineering school focuses on processes, and its aim is to provide knowledge flow. Knowledge of business and management processes is stored in shared databases and then used for planning and decision-making activities in the organization.

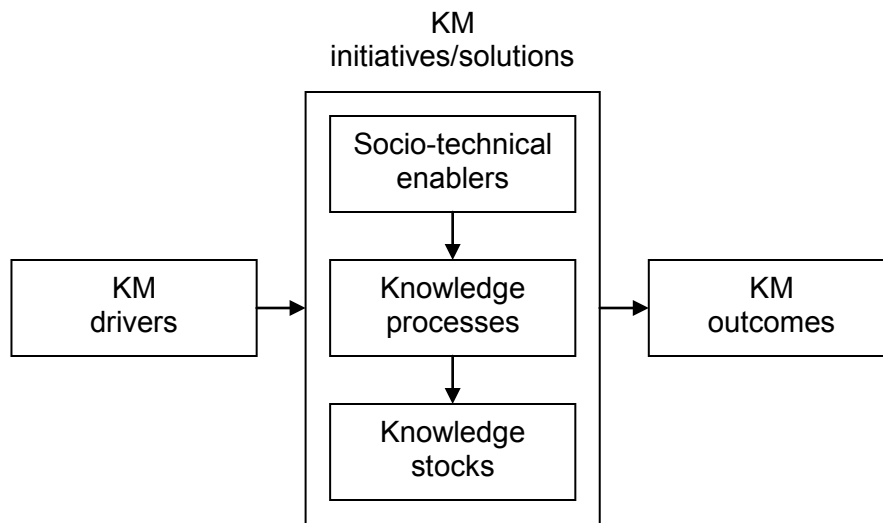
The second category in Earl’s (2001) taxonomy of schools of KM is the economic school. Earl (2001) claims that the aim of KM from this perspective is

to exploit and protect the organization's knowledge or intellectual asset of the organization by patents and copyrights to produce revenue.

The third category of Earl's taxonomy is behavioral school of KM, consisting of the organizational, spatial and strategic schools to share or collect knowledge. To exchange and share knowledge between employees is the main aim of this school. To facilitate knowledge exchange, space takes an important role. From the perspective of the strategic school, KM is a part of a competitive strategy.

#### 2.3.1 Integrated Approach to KM

To bring together all of these broad components of KM, Handzic and Zhou (2005) offer integrated KM framework model to discuss a holistic view of KM by integrating the three types of KM strategies or schools discussed by Earl (2001). This model is composed of three sections: KM drivers, KM initiatives/solution, and KM outcomes. KM initiatives comprise the organizational environment, technological infrastructure, knowledge processes, and knowledge stocks. Figure 2.6 shows the integrated framework of KM. Each of these components will be discussed through the rest of this section.



*Figure 2.6.* Driver-enabler-process-knowledge-outcome framework of KM (Handzic and Zhou, 2005).

### 2.3.1.1 Drivers of KM

Raich (2000) mentioned that globalization, transformation (or virtualization), and digitalization cause the increased complexity, uncertainty and surprises that are ultimate driving forces of KM for organizations (in Handzic & Zhou, 2005). Therefore, KM is necessary for organizations to keep up with changing global trends, shift the economy to the new knowledge-based economy, change organizational forms, and grow the importance of knowledge work (Handzic & Zhou, 2005). Because everything becomes knowledge-based, new knowledge must be adopted rapidly. Besides, workers have to create new knowledge, integrate it with existing knowledge, and reproduce new knowledge again and again (Handzic, 2004). Successful knowledge organizations show characteristics such as performing at high levels; being customer and

improvement-driven; being highly flexible; having the ability to adapt; maintaining high levels of expertise, knowledge, learning and innovation; being innovative IT-enabled, self-directed and managed, proactive and futurist; and valuing expertise and sharing knowledge (Bennet & Bennet, 2003).

#### 2.3.1.2 Organizational Enablers of KM

Handzic (2004) mentions two kinds of organizational factors, organizational environment (e.g., leadership, culture, structure, etc.) and technological infrastructure (e.g., information and telecommunication technologies) as major enablers that facilitate *knowledge processes* (e.g., creation, transfer, and utilization) and foster the development of *knowledge stock* (e.g., explicit and tacit, know what, and know how). Offering these two factors, this model accepts that KM is both a social and technological phenomenon (Handzic, 2004).

##### 2.3.1.2.1 Organizational Environment

One of the most recognized enablers or inhibitors of KM is *organizational culture*. It is important because organizational culture has an important effect on achieving organizational goals or gaining success. If knowledge sharing and new innovations occur easily in the organization, it means that the organizational culture is strong. If individuals are not willing to share knowledge because of competition, the role of top management is important in this issue. Top managers should support and innovative a knowledge-friendly culture to increase the effectiveness of the organization. It should also be taken into consideration that

changing the organizational culture does not happen in one night. Trust must come first among the organization's members, and then, the KM issue can be handled (Handzic & Zhou, 2005).

*Leadership* is another critical issue affecting KM. The role of leadership is that of controlling, coordinating, mentoring, listening, and increasing trust and respect. Knowledge managers should have strong personal, communication, and management skills; the ability to build relationships; a good education; enjoy learning and discovering new knowledge; and awareness of the importance of KM for the benefit of the organization (Handzic & Zhou, 2005).

*Organizational structure* is recognized as being even more important than organizational culture for the process of KM. Knowledge creation and sharing easily occur in team-based and networked organization structures. In contrast, hierarchically structured organizations discourage individuals from creating new innovations and sharing knowledge (Handzic & Zhou, 2005).

#### 2.3.1.2.2 Technological Infrastructure

Many organizations have adopted information technologies (IT) as a KM system itself rather than as part of a KM. As a result, undesired outcomes occur in KM implementations. On the other hand, not adopting technological innovations for KM may also be dangerous. Take into consideration the everyday improvement of technology; organizations that ignore or minimize the role of technology in the KM issue face to lose improvement and success. The logical

way is to have IT technology as a part of KM, and take advantage of its convenience in the conduct of KM (Handzic & Zhou, 2005).

Handzic and Zhou (2005) have developed seven categories in the typology of KM technologies to get better understanding of the different roles of IT in KM. These categories, KM processes, purposes, and examples are given in table 2.1.

Choosing what types of information technologies are used in KM depends on an organization's strategic objectives and the characteristic of work tasks (Handzic & Zhou, 2005). Some companies adopt two different knowledge management strategies: codification and personalization (Hansen, Nohria, & Tierney, 1999). Codification relies heavily on information technologies; knowledge is converted from people into databases by codifying and is used by other members of the organization for various purposes. This strategy provides fast and reliable quality information achievement by reusing codifying knowledge. The personalization strategy, in contrast, requires socialization among employees. It develops networks between people so that knowledge is transmitted from the person who originally had the knowledge to other people by face-to-face communication, e-mails, video conferences, and telephone conversations (human networks supported by IT). This strategy allows for creative and important advice on problems by networking individual expertise. In short, the codification strategy focuses on capturing and storing knowledge in some repository allowing users to reuse stored knowledge, while the



personalization strategy deals with sharing knowledge through person-to-person communication that utilizes information technologies.

Table 2.1

*A Typology of KM Technologies*

Category	KM process	Purpose	Examples
Knowledge storage technologies	Knowledge storage	To store organizational knowledge and enhance organizational memory	Knowledge repositories, databases, text-bases, data warehouse, data marts
Knowledge access technologies	Knowledge storage	To improve access to knowledge and/or facilitate knowledge transfer among individuals	Knowledge maps, knowledge directories, yellow pages
Knowledge search/ retrieval technologies	Knowledge retrieval	To locate internal/external knowledge and to improve access to knowledge resources	Search engines, intelligent agents
Knowledge delivery/ sharing technologies	Knowledge transfer	To deliver the right knowledge to the right person at the right time	E-mail systems, electronic bulletin boards, whiteboards, electronic forums, videoconferencing, voice mail, groupware
Knowledge discovery and visualization technologies	Knowledge creation	To uncover hidden patterns and extract new knowledge	Data mining, statistical tools, graphical representation, simulation technologies
Knowledge utilization technologies	Knowledge application	To facilitate knowledge integration and application	KM systems, workflow systems, expert systems, rule induction, decision trees
Platform technologies	All	Multiple purposes: can be used to support any or all of the above processes	Internet, intranets, extranets, portals

(Handzic and Zhou, 2005)

### 2.3.1.3 Knowledge Processes

Knowledge management processes have important roles in the KM framework. There are many classification schemes given by practitioners. For example, Grover and Davenport (2001) mentioned four categories of knowledge process: generalization, codification, transfer, and realization. Oluic-Vukovic (2001) focused on five different categories: gathering, organizing, refining, representing, and disseminating. Focusing on information instead of knowledge, Choo (1998) presented the information process in five steps: identification of information needs, information acquisition, information organization and storage, information distribution, and information use. Similarly, Bouthillier and Shearer (2002) proposed four types of knowledge processing: identifying knowledge needs; gathering knowledge through discovery of existing knowledge; storing, organizing and sharing knowledge; and using knowledge.

Alavi and Leidner (2001) suggested four KM processes: knowledge creation, knowledge storage/retrieval, knowledge transfer, and knowledge application. Additionally, they stated that there are no major differences between these different classifications. The only difference is the number and name of categories.

These four generic KM processes are adopted for this study. All steps are discussed below.

#### 2.3.1.3.1 Knowledge Creation

According to Nonaka and Toyama (2003):

Knowledge creation is synthesizing process through which an organization interacts with individuals and the environment to transcend emerging contradictions that the organization faces. This interconnection between agents and the structure makes the knowledge process to occur as a dynamic and inter-linked interaction from an individual-to-societal level (p. 3).

From this perspective, contradictions in the organization are necessary to create new knowledge. Through the knowledge creation process, organizations create and identify problems, find knowledge to solve the problem, and then create new knowledge by the act of problem solving. Knowledge creation is based on the interaction of individuals in which they share knowledge. The knowledge creation theory adopts dynamic and active process for problem solving in contrast to the static and passive view of the traditional organization theory.

Nonaka (1991) has generated four modes of the knowledge conversion model—the so-called SECI model—based on the distinction of tacit-explicit knowledge. Knowledge is created only by individuals. Organizations do not create knowledge without individuals. Organizations only support individuals for their creativity and provide them a context to create knowledge. Human knowledge is created through social interaction between tacit and explicit knowledge. This integration is called knowledge conversion. This conversion occurs in four basic steps that create knowledge: conversion from (1) tacit knowledge to tacit knowledge, (2) explicit knowledge to explicit knowledge (3)

tacit knowledge to explicit knowledge, and (4) explicit knowledge to tacit knowledge (Nonaka, 1991, 1994).

*From tacit to tacit.* One individual learns other's tacit knowledge by socializing with him via face-to-face contact, observation, and practice, mostly without language. Language has no important role of converting tacit knowledge through interaction between individuals; the key to having tacit knowledge is experience. Knowledge creation, however, is limited by socialization because none of the knowledge of individuals has turned to explicit knowledge; they do not gain any systematic conception into their knowledge.

*From explicit to explicit.* This pattern occurs when an individual combines different pieces into a new whole. In this process, new knowledge is constituted through rearranging existing information of explicit knowledge. For example, a finance manager collects information from different departments of the organization, evaluates them, and put this information into a new report. This process is called combination. Similar to the first step of conversion, this combination does not affect the company's existing knowledge either.

*From tacit to explicit.* It means to convert tacit knowledge into explicit knowledge by codifying it. Thus, other members of the organization can easily reuse this new shared explicit knowledge. This process is called externalization.

*From explicit to tacit.* After new explicit knowledge is shared throughout an organization and reused by other members of the organization, the tacit

knowledge of the members has broadened, extended, and reframed. This process is called internalization.

Three of knowledge conversion models—socialization, combination, internalization—among four of them refer to different aspects of organizational theory. For example, socialization refers to organizational culture, combination is connected to information processing, and internalization concerns organizational learning (Nonaka, 1994). Among all four patterns, only the last two—from tacit to explicit and from explicit to tacit—make powerful strides in creating knowledge in any organization (Nonaka, 1991). Figure 2.7 shows four modes of knowledge conversion.

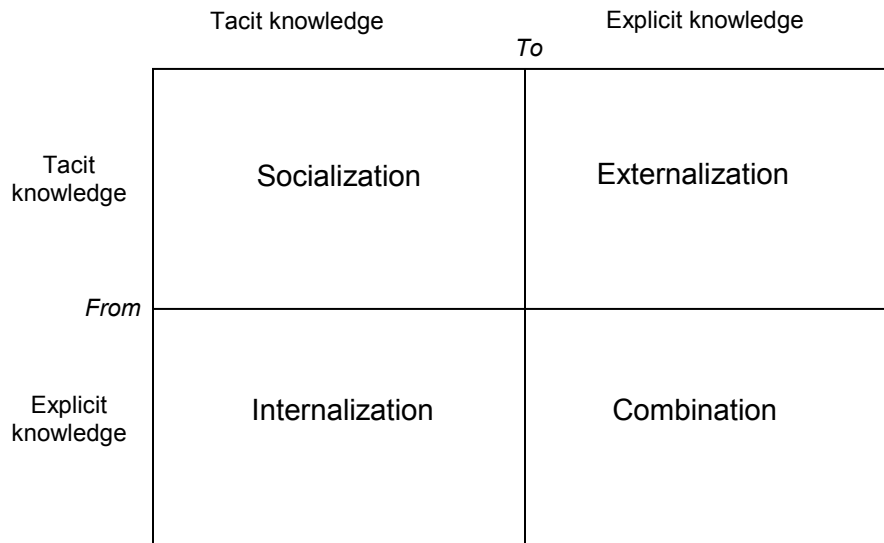


Figure 2.7. Models of the knowledge creation (Nonaka, 1994).

#### 2.3.1.3.2 Knowledge Storage/Retrieval Process

Studies have shown that organizations may forget what they have created and learned. To avoid losing information, time, and success, organizations will store, organize, and retrieve organizational knowledge, known as organizational memory. According to Stein and Zwass (1995), organizational memory is defined as “the means by which knowledge from the past, experience, and events influence present organizational activities” (p. 85-86). Organizational memory includes various types of knowledge such as written documentation, structure information, codified human knowledge, documented organizational procedures, processes, and tacit knowledge stored in electronic databases or expert systems. Advanced information technologies, such as computer storage technology and retrieval techniques, play an important role in this process for enhancing organizational memory and increasing speed to reach information (Alavi & Leidner, 2001).

Stein and Zwass (1995) have asserted that organizational memory is parallel to memory on the individual level. Therefore, organizational memory also contains both semantic (general) and episodic (context-specific) information as does individual memory. Semantic memory contains organizational practices, which are imparted in handbooks, manuals, and standard operating procedures; and techno-scientific knowledge adopted by the organization. Episodic memory refers to contextually-situated decisions and their outcomes.

#### 2.3.1.3.3 Knowledge Sharing/Transfer Process

Knowledge transfer is one of the most important parts of the KM process. Transfer occurs in various ways, such as between individuals, between groups, across groups, from individuals to explicit sources, from individuals to groups, and from group to the organization (Alavi & Leidner, 2001). The aim of knowledge transferring is to “distribute the right knowledge to the right people at the right time” (Handzic & Zhou, 2005, p. 92).

Referring to the basic elements of any two person communication, such as an information source, a transmitter, a channel, a receiver, and a destination (Shannon & Weaver, 1949), Gupta and Govindarajan (2000) have given five terms as basic concepts of knowledge transferring (‘knowledge flow’ in their terminology). These elements are (1) value of the source unit’s knowledge stock, (2) motivational disposition of the source unit, (3) existence and richness of transmission channels, (4) motivational disposition of the target unit, and (5) absorptive capacity of the target unit (p. 475).

Literature focuses mainly on the third element—existence and richness of transmission channels—of knowledge transferring. These channels can be informal or formal, personal or impersonal. Each channel has its own strengths and weaknesses (Alavi & Leidner, 2001; Handzic & Zhou, 2005). Table 2.2 shows the strengths and weaknesses for four different channels.

Table 2.2

*Comparison between the Four Channels of Knowledge Transfer*

Type of channel	Example	Strength	Weakness
Informal transfer	Informal meetings, coffee break conversations	<ul style="list-style-type: none"> <li>▪ Encourage socialization</li> <li>▪ Effective in small organizations</li> </ul>	<ul style="list-style-type: none"> <li>▪ May inhibit greater diffusion</li> </ul>
Formal transfer	Training workshops, education programs	<ul style="list-style-type: none"> <li>▪ Effective in wide distribution</li> </ul>	<ul style="list-style-type: none"> <li>▪ May hinder creativity</li> </ul>
Personal transfer	Apprenticeships, mentoring programs	<ul style="list-style-type: none"> <li>▪ Effective in transferring highly context-specific and situated knowledge</li> </ul>	<ul style="list-style-type: none"> <li>▪ May be constrained by time and resource</li> </ul>
Impersonal transfer	Knowledge repositories	<ul style="list-style-type: none"> <li>▪ Easy access to knowledge that is readily generalized to other contexts</li> </ul>	<ul style="list-style-type: none"> <li>▪ May discourage people from reusing due to the vast amount of knowledge in the repositories</li> </ul>

(Handzic and Zhou, 2005)

The actualization of knowledge transfer depends on certain conditions. A supportive organizational environment and technical infrastructure are necessary for knowledge transfer. These include (1) making knowledge visible: experts' directories and yellow pages can be used to make organizational assets visible. Sharing the names of problem solvers with knowledge maps to locate expertise can be used for making knowledge visible; (2) developing knowledge networks: organizations should use IT technologies. Intranets in the organization and



extranets among the branch of the organization are useful to establish knowledge networks; and (3) providing organizational support: establishing and using information technologies is not sufficiently enough for high quality knowledge transfer. Individuals must also be willing to share knowledge. As previously mentioned, company culture, structure and the function of management play an important role in effective knowledge transfer (Handzic and Zhou, 2005).

#### 2.3.1.3.4 Knowledge Application Process

Knowledge management is to manage existing, combined, and converted knowledge that helps improve organizational performance. Therefore, the objectives of knowledge management are “(1) to make enterprise act as intelligently as possible to secure its viability and overall success, and (2) to otherwise realize the best value of its knowledge assets” (Wiig, 1997, p. 1). Similarly, the purpose of KM is to enhance the organization’s knowledge-related success and effectiveness (Broadbent, 1998). Reaching success is measured by how much competent performance or competitive advantage the organization has achieved. Competent performance or competitive advantage can only be achieved by integrating organizational knowledge into practice. For this reason, the application of knowledge is much more important for knowledge-based firms rather than knowledge itself (Alavi & Leidner, 2001).

There are four mechanisms for integrating specialized knowledge to create organizational capability. These include rules and directives, sequencing, routines, and group problem solving and decision making (Grant, 1996).

Rules refer to set of instructions which standardize the relationship between individuals. For example, etiquette, politeness, and social norms facilitate human interaction. According to Demsetz (1998), direction is a “low-cost method of communicating between specialists and the large number of persons who either are non-specialists or who are specialists in other fields” (p. 157). Referring to a set of rules, standards and procedures, and directives facilitate the conversion of specialist’s tacit knowledge to explicit knowledge for efficient communication with non-specialists.

Sequencing and routines may be considered to have the same meaning, thus being called organizational routines (Alavi & Leidner, 2001). Organizational routines include the development of task performance and coordination patterns, interaction protocols, and process specifications by which individuals integrate their specialist knowledge without communicating with others.

The other knowledge integration mechanism is the group problem solving and decision making. While other integration mechanisms avoid the high cost of communication and learning, this mechanism requires more communication procedures between individuals by constituting problem solving and decision making groups and meetings (Grant, 1996). In this situation, uncertainty and complexity restrict the function of directives, rules, and organizational routines.

Teams of individuals come together to solve those kinds of problems (Alavi & Leidner, 2001).

#### 2.3.1.4 Knowledge Stocks

Throughout, the literature review has mentioned why KM is important for organizations. The ultimate aim of KM is to make an organization innovative, competitive, and beneficial. To reach these organizational goals, effective KM strategies are vital. Consequently, organizations need to determine what kinds of knowledge are necessary for their needs, and only then should they apply KM processes.

Holsapple (2003) explained organizational knowledge from the following perspectives:

*Data versus information versus knowledge.* Differences among these three concepts have already been discussed. Similarly, Holsapple (2003) indicated that data are isolated facts. Data turns into information by being meaningfully processed, and knowledge is information that is evaluated internally.

*Knowledge state.* The knowledge state shows other levels of an individual's progression outside of the data-information-knowledge hierarchy. Other processing states are given as: gather → DATA → select → INFORMATION → analyze → STRUCTURE INFORMATION → synthesize → INSIGHT → weigh → JUDGEMENT → evaluate → DECISION (Holsapple, 2003, p. 168).

*Stocks and flows.* From the production perspective, knowledge is seen in stocks and flows. Knowledge stocks are inventories of knowledge for one or more processors. Knowledge in any inventory may include any representation such as symbolic, digital, mental or behavioral. Knowledge flow can occur in several ways: from one stock to another or from a stock into itself to produce new knowledge.

#### 2.3.1.4.1 Organizational Knowledge Assets

Business organizations are economic-orientated institutions. For those, knowledge management is necessary to get economic value in industry and market context. Becoming a competitive organization and having benefits necessitate implying effective and efficient management of organizational knowledge assets including human capital, organizational (internal) capital, and customer (external) capital (Handzic & Zhou, 2005).

Knowledge is a complex context to define. Knowledge assets are also vital for organizations to produce, succeed, and survive in the new economy. As an organizational asset, human capital refers to intangible knowledge, organizational capital refers to codified knowledge about the organization in electronic databases, and customer capital refers to any knowledge related to customers with whom the organization is related.

#### 2.3.1.4.2 KM Outcomes

Currently, many organizations are implementing KM projects. KM is not a one-off activity, and it should continue towards the goal of becoming a smarter

organization. It is also important to mention that getting benefits from a KM initiative takes time. Therefore, organizations need to be aware of their expectations in achieving the desired outcomes (Handzic & Zhou, 2005).

This component of the integrated framework KM model focuses on three types of KM outcomes: knowledge retention, productivity improvement, and innovation (Handzic & Zhou, 2005).

Knowledge retention is a kind of risk minimization. To be successful in retaining knowledge, organizations need to find ways to retain critical knowledge. If it is codified knowledge, different tools should be used to keep and share it. Intangible knowledge needs to be identified and shared throughout the organization by building an open, responsive, and trusting environment.

Productivity improvement is a way to increase performance efficiency and effectiveness. Performance productivity involves providing better knowledge, changing the organizational environment, and adopting new technologies in order to allow employees to produce better products.

Innovation refers to new products and processes that increase organizational effectiveness and efficiency. KM is the best strategy to enable innovation. To become successful in innovation, organizations need to see organizational knowledge as an asset, remove knowledge barriers, and develop a trustful environment.

## 2.4 Knowledge Management in Law Enforcement Agencies

Like any other public or private organization, effective KM is a crucial issue in policing. Knowledge management can be defined as the process of creating, storing, sharing, and using knowledge to enhance organizational performance (Davenport et al., 1998; Wiig, 1997). Naturally, policing is a knowledge intensive organization. Therefore, the effective and efficient use of knowledge is necessary to increase organizational success. The use of knowledge depends not only on successfully established information technologies, but also effectively managing the police organization's assets. In response to these issues, many countries' law enforcement agencies have set up computer web and operating systems to evaluate knowledge professionally.

The following sections review what kinds of knowledge management systems various international law enforcement departments utilize.

### 2.4.1 USA-COPLINK

The COPLINK project has been established at the University of Arizona's artificial intelligence lab by collaboration efforts of the Tucson Police Department (TPD) and the Phoenix Police Department (PPD). The main goal of COPLINK is to develop a knowledge management system for capturing, storing, evaluating, and sharing law enforcement-related information (Chen, Zeng, Atabakhsh, Wyzga, & Schroeder, 2003). Focusing on the development of different knowledge management technologies, the COPLINK project includes the Connect Database, Detect Criminal Intelligence Analysis, and Intelligent Agent

applications. This project was developed to deal with the problems and issues arising from information sharing and criminal analyses within and between law enforcement agencies (Hauck, Chau, and Chen, 2002).

COPLINK Connect allows diverse police departments to share information through an easy-to-use interface (Chen et al., 2003). COPLINK Detect identifies relevant terms and their relationship with each other in one search. The aim of this tool is to reveal relationships between and among different crime-related entities by analyzing five entity fields: person, organization, location, vehicle, and incident type (Hauch et al., 2002).

The daily routine of many crime analysts and detectives at TPD is to create knowledge by analyzing current criminal records and information. The current TPD records management system (RMS) has many problems related to incompetence of access information and knowledge management. Even though officers could access large amounts of data related to criminals, combining information to create knowledge took a lot of time. Therefore, the real problems were lack of database integration, information sharing, and knowledge management. To overcome these problems, the COPLINK Connect application was established.

The COPLINK project deals with the problems of information integration and is easy to access. The easy-to-use interface allows law enforcement personnel to access integrated data sources. Additionally, information sharing both within and between law enforcement organizations has become possible

(Hauch et al., 2002). Research shows that COPLINK Detect increases productivity by reducing time spent searching for information (Chen et al., 2003). On the other hand, there are some areas to be improved. For example, crime detectives and analysts needs more than what COPLINK Connect provided. Moreover, COPLINK Detect does not provide a map of location which is extremely valuable for crime detectives and analysts (Chen et al., 2003).

#### 2.4.2 Germany

Data from the German Federal Police, Bundeskriminalamt (BKA), is in the states (Pekgozlu, 2003). The data first comes to local data centers and then to state data centers because Germany consists of 16 states. Data, then, comes to the BKA mainframe data center. Indeed, not all data come to the data center of the Federal Criminal Police Office of Germany since not all data are needed at federal level. Some data are sent to the main data center in Strasbourg, France because European Union countries agreed to share policing data within the borders of the European Union. The shared data system is called the Schengen Information System (SIS) database.

BKA has a database named “Inpol” to share data about crime across police departments. The German Police collects personal, property, and crime data in Inpol databases. Some data are shared at the federal level, whereas some remain at the state level. Not all data are shared with state agencies. The person who enters the data into Inpol decides whether to share the data at federal level or state level, although there are some rules for decisions about



data entry. There is also another database named LUNA, a subsystem of Inpol, that stores automobile data. The Inpol database has a number of sub-databases to collect and manage data. When states need data, they must apply to the BKA mainframe since all data is collected at the mainframe server.

The German Police also have the Automated Fingerprint Identification System (AFIS) to collect data about fingerprints. They do not share the fingerprint database with other countries. This system enables the police to compare similar fingerprints if needed. The fingerprint inquiries are exercised at federal level. Thirty-seven state-level fingerprint centers send their data to the main system and all data are collected at the central fingerprint database.

BKA runs the main databases. States can also apply to BKA central databases to look for data and information they need. States do not have a mainframe database, but they can use BKA's databases. BKA does not have a database for driver's licenses or passports. BKA does not have personnel in states; it relies on the state-level personnel of law enforcement agencies for data. Not all computers have access to AFIS or Inpol. In other words, a limited number of computers all across the country have access to the mainframe computers of BKA. The mainframe computer also has a substitute computer in case of any need.

#### 2.4.3 Australia

Australia is a federal country consisting of six states and two special districts. Each state and district has their own police organization. The federal

government also has its police force, the Australian Federal Police (AFP). The center of AFP is in Canberra, the capital. AFP has bureaus and branches with its own personnel in every state and district. In each state, Pekgozlu (2003) maintained, AFP has special agents who are experts in the federal law enforcement database, PROMIS.

PROMIS is a Web-based database functioning through secured web providers. It is located and managed in Canberra, but agents in states can use and seek needed data in the database simply through their computers in the local branches and bureaus. Other state agencies may also use PROMIS by demanding needed information from the central body of AFP; if AFP approves the release of the demanded data, they send the data through its branches and bureaus in the states.

It is noteworthy that AFP has sold the usage rights of PROMIS to some states' police departments. It is not cheap; hence, some states could not afford to pay for and use the database. In addition, public prosecutors have also access to the database of PROMIS. There are a number of sub-databases under PROMIS. However, unlike the German Police, AFP does not have a shared database with other countries. It is also notable that AFP has agents in 18 countries all across the world due to international security agreements and peacekeeping efforts. These international agents have access to AFP's PROMIS.

#### 2.4.4 Canada

In Canada, each state has its own police organization. Each police organization has its own information collection and sharing system. Each state has its own intranet system to effectively communicate security-related information. The federal government has its own law enforcement force, the Royal Canadian Mounted Police. According to Pekgozlu (2003), the federal police run an information-sharing database that all police organizations across the country can reach through an intranet computer system. The system is called the Canadian Police Information Center (CPIC). This is the only database that all police forces, state and federal, can use. It has been used since 1972. The system includes a number of sub-databases, including information about the homeless, property, crime and criminals, and automobiles.

#### 2.4.5 Conclusion

Security and safety is one of the most immediate needs of human beings. Countries need to provide safe and secure public spaces for their citizens. That is why law enforcement is a vital public service all across the world. To fight crime and criminals, to collect intelligence prior to criminal events, and to make analyses to prevent future criminal events in the light of the past, police organizations need to effectively and efficiently collect information related to the safety and security of their citizens and their country. The collection of such data is essential, as well as sharing it effectively with police agencies in different and, perhaps distant, areas. That is the reason countries consider information

collection, sharing, and management in a law enforcement organization as a central concern. All the countries that this study analyzed have varying degrees and characteristics of law enforcement information-management systems.

The countries this study analyzes have federal structures in which different states and special districts run their own governments with a varying degree of autonomy. These autonomous governing bodies have their own police forces. Each police force has its own information collection and sharing system, which eases the management of data locally. Usually, the federal government's police forces also have an information management system wherein all states and special district police forces can retrieve data for their own purposes. In other words, the countries discussed above have multiple actors to collect and share policing data.

The Turkish National Police are the only police force of the country, however, that deals with all data and information about crime and criminals as well as safety and security issues from all across the country. There are multiple databases in the POLNET system to collect, manage, and share data that the police need. The Turkish National Police, through POLNET, seem to effectively manage data and share it with its branches throughout the country.

## 2.5 POLNET

Information is the most important value for civilization. Increasing civilization depends on the creation of new information and knowledge. Human beings have needed information and knowledge since the beginning of time.

Since then, various ways have been used to access information. Today we are living in the information or knowledge age. Improvement of information technologies forms brings knowledge to society. All developed countries use technology for their own development economically and socially. As one of the most important security components of the knowledge society, it cannot be thought that the police organization does not keep in step with increasing technology. For this reason, in Turkey, the national police force has created a police computer network and information system, known as POLNET-2000, that has been in existence since 1996 to provide access to all necessary information related to police duties from anywhere, at anytime, and as quickly as possible.

#### 2.5.1 Emergence of POLNET-2000 Project

The General Directory of the Turkish National Police (TNP) decided to establish an information-processing web within the organization in 1988. In the framework of this project, between 1990 and 1995, necessary materials were purchased. The police always have to be one step ahead of criminals to prevent crime. For this reason, information flow is very important among divisions. The old system, however, was not sufficient enough to meet all requirements and had some deficiencies such as having different databases for every division, not allowing information flow among different databases, and not serving the need for capturing images or voices. New developing technologies led TNP to adopt a management system to provide more effective and efficient service to society. After research and investigation, TNP concluded that new network system, which

could adopt new technologies, provide voices, videos, pictures and images, and be fast and secure, was necessary. This project was named POLNET-2000. POLNET referred to the police computer network, and 2000 indicated that this project would be completed by the year 2000.

POLNET-2000 has focused on two fundamental issues. The first one is a police databank; that allowed for the integrator of different independent databases under one information system. And the second issue is a system and transmission infrastructure that includes computer, cable, modem, and such infrastructure devices to connect all departments to the established police databank. Parallel to the needs of the organization, changes in the scope of the project, and technological improvement, the POLNET-2000 project was divided into two different parts in 1999. Their names are Police Computer and Communications Network Infrastructure (TransPol) and Police Information System (POLNET). The role of POLNET in this new structure is transmitting information processing service to all units of the police organization. TransPol serves not only for data transmission, but it has also allowed voice, picture, and video sharing.

#### 2.5.2 POLNET Today

As previously mentioned, POLNET is the general name of information systems that provides access to information concerning police issues anywhere, at anytime, with high speed and security. Today, POLNET is used in 82 cities,

751 countries, 93 border gates (air, land, sea and railway), and others units

(Table 2.3) across Turkey.

Table 2.3

*POLNET Communication Infrastructure (TNP Database)*

UNITS	ACTIVE	PASSIVE	TOTAL
Centers/ Central City Police Departments	82	---	82
County's Police Departments	751	---	751
Border Gates	93	---	93
Police Guest Houses	15	---	15
Police Stations	503	7	510
Additional Departments of Central and County Police Departments	652	20	672
External Connections	12	---	12
Police Education Centers (Police Schools, Police Academy, Police College)	33	---	33
TOTAL	2141	27	2168

2.5.3 Programs used within the POLNET System

There are 43 national programs, 11 ongoing projects, and 7 projects which are planned to begin in 2008.

Table 2.4

*National Programs (TNP Database)*

1. Restriction	2. Traveler	3. Lost passport	4. Wanted persons
5. Foreigners	6. Refuge	7. Passport	8. Vehicle registration
9. Driver	10. Accident (new version)	11. Wanted/ stolen vehicles	12. Weapon registration (new version)
13. Identity registration	14. GBT	15. Press	16. Political parties
17. Unions	18. Security investigations (new version)	19. Archives scrutiny	20. Digital archives
21. Digital documents/papers	22. Custody operations	23. AKKM statistic program (new version)	24. Smuggling
25. Wanted/ lost cultural asset	26. Terror	27. Detailed interrogation	28. PolNet statistics program
29. Personnel information	30. Law service/ Trial prosecution	31. Information gain application	32. Identity sharing/ identity information
33. Lost objects/things	34. Goods pursuit system (personal estate management module)	35. Person program (new version)	36. MOBESE (Mobile Electronic System Integration)
37. TBS (Traffic Information System)	38. E-mail, fax, telex	39. AFIS (Finger Prints Program)	40. KPL (Criminal Police Laboratory)
41. PBS (Personnel Information System)	42. MBS (Law Information System)	43. POMEM application system	



Table 2.5

*Ongoing Projects (TNP Database)*

1. Goods pursuit system (Budget module)	2. Terror program (new version)	3. Detailed interrogation (new version)	4. PolNet statistics program (new version)
5. Custody program (new version)	6. Foreigners program (new version)	7. Vehicle registration program (new version)	8. Smart Client project
9. EBDYS (Electronic Document Management System)	10. Interpol wanted vehicle program	11. Storing and transmission of all units web pages and services in these web pages from central internet host	

2.5.4 Why is POLNET Important for TNP?

POLNET is the only KM system in Turkish law enforcement. It is designed according to the needs of the organization. In the case of necessity, the POLNET system can be easily adapted to new technological improvements.

POLNET allows information and knowledge sharing among all departments all over Turkey. Now, every unit can reach any necessary information at anytime, anywhere, by the fastest, most secure way.

Because of POLNET, the quality of service has been increasing. For example, evidence can be collected in a short period of time, so custody time decreases. Criminals are caught in a short time. Finger prints, ballistic comparisons, DNA analysis, blood and tissue analysis, and similar documents are transmitted all over the police departments at the same time. Citizens can gain information and fulfill some requirements such as passport application

without going to police stations through accessing POLNET. Many processes about passports, car registrations, and driver's licenses can be conducted online. POLNET can also reach all personnel at the same time by making announcements and broadcasts through the POLNET main web page. This decreases time and paper consumption.

POLNET is not only an intranet system; it also has connections with other government agencies to establish knowledge networks. Some of these government agencies are the Ministry of Defense, the Premiership, the National Intelligence Organization, the General Directorate of Gendarmerie, and the Ministry of Justice.

## CHAPTER 3

### METHODOLOGY

#### 3.1 Introduction

The presented study is designed to evaluate the KM process of the POLNET system according to the KM integrated approach (Handzic & Zhou, 2005). For this reason, this study employs a qualitative case study for both exploratory and descriptive purposes that reveal a KM model for the POLNET system according to the acquired answers to the research questions. The major question of this study is whether the KM strategies of TNP match with the KM integrated model. Minor questions deeply investigate the KM process of the POLNET system. Table 3.1 shows components of the KM integrated model and related survey questions asked to reveal whether the KM strategies of TNP match with the KM integrated model.

This chapter discusses the research approach and strategy, characteristics of population, data collection methods, reliability and validity of the research, and limitations of the study.

Table 3.1

*KM Integrate Model Components and Survey Questions*

KM Integrate Model Components	Survey Questions
KM Drivers	How did the idea of POLNET emerge? What were the main reasons for establishing POLNET?
Organizational Culture	Do you think the culture of TNP supports information sharing and innovation?
	If so, how does the culture of TNP supports support information sharing and innovation, and which characteristics of the culture are they?
	If no, why? What are the obstacles in information sharing and transferring?
Leadership	How do you describe attitudes of top-level police administrators toward the establishing of POLNET?
	Do you think that management skills of department's chiefs affect information sharing through POLNET? How?
	What kinds of characteristics should leaders have to support information management through POLNET?
Organizational Structure	Does the organizational structure of TNP affect information sharing through POLNET? How?
	Do you think the organizational structure of TNP encourages or discourages participation and collaboration among members of TNP?
	Are there any differences among different ranks in terms of involvement in information processes through POLNET?
Technological infrastructure	Before POLNET, what kinds of information management strategies did TNP adopt? What were the disadvantages or advantages of these techniques?
	Are there any kinds of information creation, storage, retrieval, and transfer technologies used through POLNET? If so, what are they?
Knowledge Processes	Among SECI modes (socialization, combination, externalization, internalization), what kind(s) of knowledge conversion method(s) is/are generally used through POLNET? Why?
	What kinds of information are shared through the POLNET system?
	How is information transferred through POLNET?
	Are members of TNP willing to share information?

*(table continues)*

Table 3.1 (continued).

KM Integrate Model Components	Survey Questions
KM Outcomes	What results does POLNET produce?
	Does the result of POLNET usage affect service delivery (system or programs of POLNET)? If so, how? If not, why?

### 3.2 Research Design

#### 3.2.1 Research Strategy

A research strategy is a general plan that determines which methods the researcher uses to obtain answers to research questions. This plan contains clear objectives; sources of collecting data and some constraints such as access to data, time, location and money; and ethical issues (Saunders, Lewis and Thornhill, 2003). In general, this study employed a qualitative methodological approach to understand KM in law enforcement. Secondly, as a research strategy, a case study is adopted to explore and describe how KM strategies were implemented in the POLNET system. Both qualitative methodology and case study provide correct methods to conduct the study and to collect data that answers the following research questions:

- MRQ: Do KM strategies of TNP match with the KM integrated model?
- SRQ 1. Which drivers triggered the POLNET project?
- SRQ 2. Do organizational culture, structure, and leadership features affect the POLNET system?
- SRQ 3. What is the technological infrastructure of the POLNET system?

SRQ 4. What are the KM processes of the POLNET?

SRQ 5. Do outcomes of the POLNET system affect drivers?

### 3.2.2 Qualitative Methodology

In general, this study employed a qualitative methodological design to explore and describe KM strategies adopted by TNP during establishing and using the POLNET system. Denzin and Lincoln (2008) described qualitative research as “a field of inquiry in its own right” (p. 3). One of the most important reasons for conducting a qualitative study is that the study is exploratory (Creswell, 2003). Qualitative methods allow the research study to investigate selected issues—in this dissertation, the KM issue in TNP—giving more attention to details, contexts, and nuances (Patton, 2002).

Exploratory studies are conducted to understand what is going on. It is particularly useful in this study to clarify the understanding of KM steps adopted during the establishment of the POLNET system. This research adopted two principle ways of conducting exploratory research. First, I searched literature concerning KM and POLNET, and then, interviewed and surveyed experts in the POLNET system.

This research is also a descriptive study because the purpose of this study is to give accurate descriptions of the KM strategies of the POLNET system. As Robson stated in Saunders et al. (2003), the object of descriptive research is “to portray an accurate profile of persons, events or situations” (p. 97). Therefore, it is important for descriptive research to have a clear picture of the phenomena

that I want to study before collecting data. The literature review about KM and POLNET gives that clear picture in this research.

### 3.2.3 Case Study

Creswell (2003) stated that case studies are when “the researcher explores in depth a program, an event, an activity, a process, or one or more individuals” (p. 15). Similarly, Patton (2002) suggested that “case analysis involves organizing the data by specific cases for in-depth study and comparison” (p. 447). In evaluation, any individual, group, neighborhood, program, organization, culture, region, or nation-state can be a case study. Similarly, Saunders et al. (2003) indicated that this strategy is particularly appropriate for researchers who want to gain a rich understanding about the context. Case studies answer the why, what, and how questions of the research. Researchers who adopted the case study strategy may use a variety of data collection methods such as questionnaires, interviews, observation, and documentary analysis.

This qualitative research focused on KM steps applied in the establishment of the POLNET system, and I chose the POLNET system as a case. I adopted the case study strategy to find satisfactory answers to research questions related to the POLNET system. As Patton (2001) indicated, cases for study are selected because they are “information rich” (p. 40).

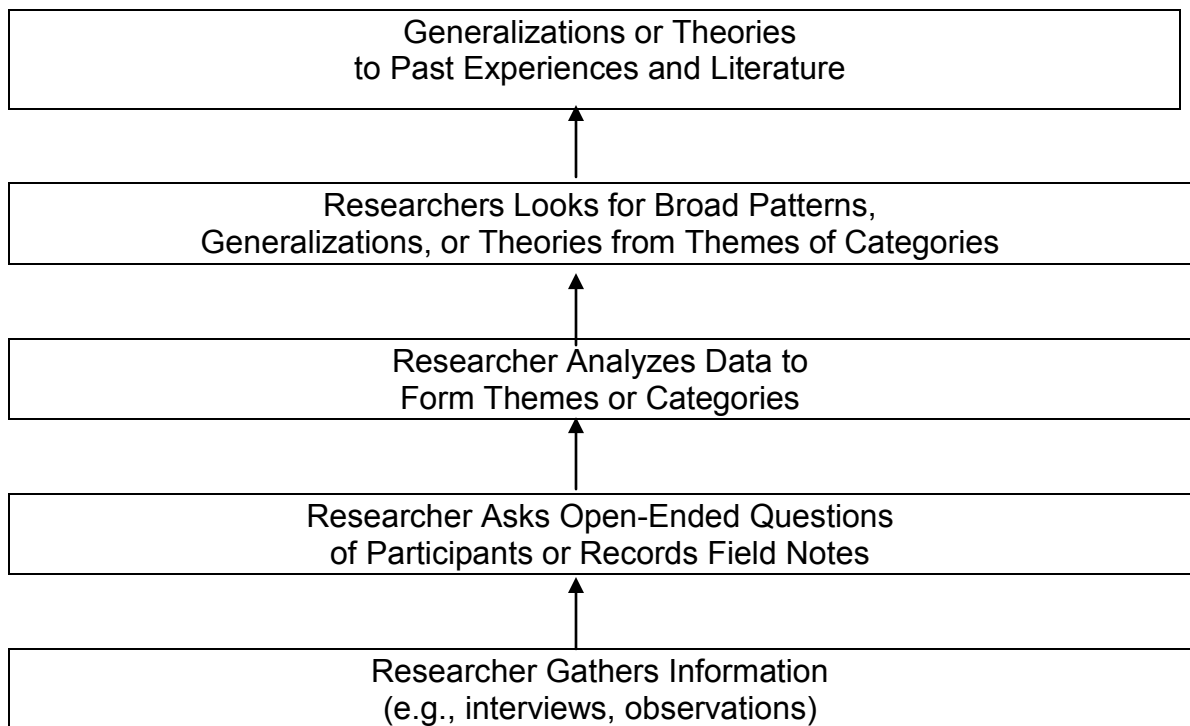
### 3.3 Research Approach

All research projects must involve the use of theory. In the design of the research, the theory may or may not be made explicit, even though it is usually presented in the findings or conclusions section. However, the important question raised is about the design of the research study: whether the research study follows the deductive or inductive approach. In the deductive approach, a researcher first develops a theory and hypothesis, and then, designs a strategy to test the hypothesis. In contrast, with the inductive approach, data collection comes first, and then, according to result of data analysis, the researcher presents a theory (Saunders et al., 2003). Creswell (2003) showed the logic of inductive approach in figure 3.1.

This study adopted inductive analysis as a research approach because of its appropriateness to the design of the study. Exploration, discovery, and inductive logic are three important components of qualitative inquiry. Without giving any specific research hypotheses before data collection, inductive analysis allows the researcher to build general patterns beginning with specific observations about the phenomenon being investigated. An open-ended interview in this approach permits respondents to explain their thoughts without being put into standardized categories (Patton, 2002). Thereby, in this research study, I first established research objectives and questions about the KM strategies of the POLNET system. Secondly, I reviewed the literature about KM strategies in depth. Lastly, by collecting and analyzing the qualitative data set



that came from semi-structured face-to-face and telephone interviews, as well as a self-administered questionnaire delivered to respondents via e-mail, I answered the research questions to explore and describe the KM strategies of the POLNET system and gave a KM model of POLNET.



*Figure 3.1.* The inductive logic of research in a qualitative study (Creswell, 2003).

### 3.4 Characteristics of the Study Population and Sampling Strategies

The sample was selected from the police administrators who have personally attended to configuration steps of the POLNET system, working both under the Department of Information Technologies and the Department of Communication. A purposeful sampling method was used to draw samples in this

study because the samples must have had an active role during the establishment of POLNET to answer research questions. Saunders et al. (2003) emphasized that purposive or judgmental sampling enables the researcher to use his/her judgment to select a sample that enables the researcher to answer the research question(s), as well as meet research objectives.

Additionally, Neuman and Wiegand (2000) stated that purposive sampling is suitable in three situations: first, a researcher uses purposive sampling to select unique cases; second, if the sampling members are difficult to reach, a researcher may use purposive sampling; and third, it is used when a researcher wants to give the case deep investigation.

Patton (2002) has written that

The logic and power of purposeful sampling derive from the emphasis on in-depth understanding. This leads to selecting *information-rich* cases for study in depth. Information-rich cases are those from which can learn a great deal about issues of central importance to the purpose of research, thus the term *purposeful* sampling. (p. 46)

According to nature of the study, interview and questionnaire questions were selected for the purpose of answering research questions to deeply understand the case of the KM strategies of POLNET and enabling the objectives of the research. Therefore, the samples answering the interview and questionnaire must understand the logic of the POLNET system since its establishment, rather than simply use it. Knowing that the personnel who have worked in the TNP

Information Technologies and Communication Departments worked on establishing of the POLNET system, it is assumed that those personnel have more theoretical knowledge than any others who work in other departments. Thus, the main reason why the purposive sampling method was adopted to choose samples was that the selected samples have more cognitive understanding of the POLNET system, and they can give more accurate answers to the related questions about POLNET.

After determining the sample frame, which is constituted by the police administrators who work under the Department of Information Technologies and the Department of Communication, located in the TNP General Directorate building in Ankara, Turkey, I chose samples who are in the US while obtaining graduate degrees. I included every administrator who has worked under two departments. 18 people were identified. Two of them are superintendents, five of them are majors, nine of them are captains, and two of them are lieutenants. The lieutenants (N=2) were eliminated because by the time they started work after graduation from the Police Academy, the POLNET system had already been established. The researcher contacted other 16 TNP members, all of whom agreed to be part of the study. However, two respondents (one is a major and the other one is a captain) did not answer the survey even though they received it. Table 3.2 shows the general characteristics of the samples.

Table 3.2

*General Characteristics of the Samples*

Ranks	Respondents	Service year in TNP	Service year in department
Superintendent	respondent 1	16	6
	respondent 2	15	8,5
Major	respondent 3	13	6
	respondent 4	13	8
	respondent 5	13	10
	respondent 6	12	7
Captain	respondent 7	8	6
	respondent 8	10	5
	respondent 9	10	5
	respondent 10	10	6,5
	respondent 11	10	4,5
	respondent 12	10	3
	respondent 13	10	6
	respondent 14	9	5

3.5 Data Collection Method

To answer the research questions, data was collected through a semi-structured interview method and a self-administered questionnaire delivered to respondents via e-mail. The researcher also got documentary evidence about the steps of establishment of the POLNET system. Using interviews as a data collection method can help a researcher achieve valid and reliable data that are appropriate to the research question(s) and objectives. Semi-structured interviews provide useful information to identify and describe a phenomenon. In semi-structure interviews, the researcher has a list of questions to ask. During the conversation, some questions may be omitted or extra questions may be

added. Depending on the flow of the interview, the order of questions may also be varied (Saunders et al., 2003).

Interviews were structured by meeting with participants through either face-to-face or telephone interviews. I e-mailed all samples to inform them about the study and asked them if they would voluntarily answer the questions about POLNET. All 16 respondents agreed to participate, either through interviews or e-mail questionnaires. First, all samples received a self-administered questionnaire delivered via e-mail. Two of them did not answer the questionnaire. Even after polite reminders, I failed to receive any response from those two respondents. The rest of the respondents answered and sent the questionnaire back to the researcher. Additionally, I conducted face-to-face interviews with four samples, and interviewed two samples by telephone. Some of these interviews were recorded at the request of the participants. When the interview was not recorded, I took notes during the conversation.

### 3.6 Data Analysis

This section is designed to analyze the qualitative data that was collected for this research. According to Saunders et al. (2003), qualitative data cannot be collected in a standardized way to capture phenomenon comprehensively. The analysis part of qualitative data, however, has to be handled systematically. Otherwise, data may not provide any meaningful result.

This study adopted the process of inductive content analysis through which patterns, themes, and categories are discovered in one's data (Patton,

2002). Content analysis is a technique for examining information, or content, in written or symbolic material. Content analysis is used for exploratory and explanatory research but is most often used in descriptive research (Neuman and Wiegand, 2000). Additionally, Patton (2002) asserted that “qualitative analysis is typically inductive in the early stages, especially when developing the code book for content analysis” (p. 453).

Data analysis is a complex process. This process includes at least two different processes. The first is “detailed examination” or “identification of themes.” The second is “determination of its essential features” or “understanding” or “construction of propositional statements” (Tesch, 1990, p. 114).

I used the following approaches for data analysis as suggested by Creswell (2003):

*Step 1:* Organize and prepare the data for analysis (p. 191).

- Transcribe interviews, scan material, type field notes, sort and arrange the data into different categories depending on the source of information

*Step 2:* Read through all the data (p. 191).

- Obtain a general sense of the information and reflect on its overall meaning

*Step 3:* Begin detail analysis with a coding process (p.192).

- Separate text data, pictures, paragraphs, and images into categories
- Label those categories with a term

*Step 4:* Use the coding process to generate a description of the setting or people as well as categories or themes for analysis (p. 193).

- Description: a detail rendering of information about people, places, or events in a setting.
- Use the coding to generate a small number of themes or categories

*Step 5:* Advance how the description and themes will be represented in the qualitative narrative (p. 194).

- Use a narrative passage to convey the findings of the analysis, or
- Use visuals, figures, or tables as adjuncts to the discussions

*Step 6:* Make an interpretation (p. 194).

### 3.6.1 Preparing Data for Analysis

Data for this study came from three sources; semi-structured face-to-face and telephone interviews, self-administrated questionnaires, and documentary evidences. The first step of this analysis was to organize and prepare data for analysis [Creswell's (2003) approach, Step 1]. For this step, recorded interviews were transcribed. However, not all were copied verbatim. Only the relevant segments were transcribed. I did not use any computer software program for this transaction because the number of interview protocol was few.

After having all data, transcribing interview data, questionnaires, and documentary evidences, I read materials from beginning to the end without making any writing in the margins, underlining, or taking notes [Creswell's (2003) approach, Step 2]. The idea behind this first reading is "to enter vicariously into the life of participants, feel what they are experiencing and listen to what they are telling" (Corbin and Strauss, 2008, p. 163). Therefore, the first reading allowed me to gain a general understanding about the concept, respondents' experiences and viewpoints about POLNET.

### 3.6.2 Organizing Data

Analysis refers to two operations together: data organizing and data interpretation. In the qualitative data analysis, organizing data includes dividing the text into segments and sorting (coding) these segments into groups (Tesch, 1990). Some other researchers (Charmaz, 2002; Corbin and Strauss, 2008; Creswell, 2003; Patton, 2002) use the term coding from conceptualization to the end.

Coding is the first analytic step in which the researcher moves from description to conceptualization. The coding procedure requires the researcher's close attendance to the data. The codes also reveal the researcher's interests and perspectives as well as the information in data (Charmaz, 2002). The goal of coding is to learn from the data and use it until all the patterns and explanations are understood by the researcher (Richards, 2005).



The researcher should use coding for at least one purpose. Purposes may vary for qualitative coding. Richards (2005, p. 87) lists some of the purposes that most researchers utilize coding:

- To reflect on what the coded segments tell you about the category and its meanings in the project;
- To ask questions about how the category relates to other ideas from the data and construct theories about those relations;
- To gather all material about a case from different sources, so you can apply the information about that person or site to everything from that case and compare cases on their attitudes, experiences, etc.;
- To make further, finer categories from finding different dimensions in the data gathered by the first coding;
- To search for blends or combinations of categories, to find patterns in attitudes on this subject, for example by gender, or to compare text at different categories, seeing the category from a different viewpoint;
- To compare how different researchers interpret data.

Many of these purposes reflect reasons for coding procedures of data used in research studies.

### 3.6.3 Segmenting / De-conceptualizing

In this step, I have begun to examine data in depth. First, I separated relevant portions, called segments, of data from their context, considering conceptual theory affirmation [Creswell's (2003) approach, Step 3]. This kind of

coding is called “analytical” coding (Richards, 2005, p. 88). In this study, I decided to apply analytical coding rather than descriptive coding or topic coding because one of the objects of this research study is to build theory.

A segment is one piece of text that is understandable and contains one piece of information, one idea, or one meaning. Segments are also referred to as items, incidents, meaning units, analysis units (Tesch, 1990), conceptual labels, or themes (Corbin and Strauss, 2008). Tesch (1990) also viewed the segmenting step as de-contextualization by which some of the text has been taken out of its context.

#### 3.6.4 Organizing / Categorization System

Tesch (1990) stated that there are two basic approaches for establishing an organizing system: “1) it can be created from prior material, such as the theoretical framework adopted and/or the research questions that guide the investigation; or 2) it can be constructed from the data themselves” (p. 119). Tesch (1990) also added that those two approaches are combined in many cases.

In this research study, the organizing system was established based on the project’s questions and method. The questions prepared for the interview and questionnaire led the researcher to categorize data. While establishing categories, sub-questions were also considered categories [Creswell’s (2003) approach, Step 4].

### 3.6.5 Sorting (Coding) Data

Codes are “abbreviations of the labels for the categories” (Tesch, 1990, p. 121). In this step, data were divided smaller pieces, and the coding procedure was applied to words, sentences, or paragraphs under each category [Creswell’s (2003) approach, Step 5]. The category “necessity of new system,” for instance, could become NESS-NEW or “organizational culture” could be ORG-C. This type of coding is also called mnemonic because they help the researcher remember the actual name of the category (Tesch, 1990, p. 121).

### 3.6.6 Re-contextualization

Even though all data were coded, they were not ready for interpretation. To interpret data, I brought everything that belongs in one category together. The process continued until all coded words/sentences went under the relevant categories and those categories to the relevant segments. This process facilitated me in reading data in a continuous mode.

### 3.6.7 Summary of Analysis Procedure

In summary, during analysis, the first step was to prepare the data. For this purpose, I transcribed recorded interview protocols, and both transcribed interview data and questionnaire data were brought up together (Step 1). After, I read all materials from beginning to end to gain a general concept about POLNET (Step 2). I used the coding procedure according to the developing research theory model, and the interview and survey questions. First, data were divided into segments based on the model (Step 3). Later, these segments were

separated into smaller parts by the interview and survey questions (Step 4). The last step of the coding procedure was sorting data. In this step, I gave abbreviations to the category labels for coding data (Step 5). This procedure helps the researcher to remember the real names of categories. The last step before interpretation was to re-contextualize data. In this step, all coding data and categories went under the related segments. This process prepared data to be interpreted.

### 3.7 Reliability and Trustworthiness

In social science, reliability and validity issues are two important aspects of research. The quality of operational definitions is described by the terms “reliability” and “validity.” For quantitative research, reliability refers to stability and consistency of the experiment, test, or instrument (Singleton & Straits, 2005). If the same procedure is applied in the same way and the same result is achieved after every time, it is claimed that the method is reliable (King, Keohane & Verba, 1994).

On the other hand, Saunders et al. (2003) asserted that reliability is a weakness of qualitative research in that the findings come from non-standardized research methods “since they reflect reality at the time they were collected” (p. 253). Because of the flexibility of non-standardized research methods, it would not be realistic to have the same results in the case of replication of the study. Similarly, Creswell (2003) asserted that reliability and generalizability play an insignificant role in a qualitative study. However, I believe that different

researchers may have similar results even though using different samples if selected the sample is knowledgeable about the establishment of the POLNET system.

Validity, on the other hand, has been strongly debated as to its usefulness in a qualitative research. It is suggested that validity should be determined whether the findings are accurate according to the researcher, the participants, or the readers. The term 'validity' is also a highly debatable topic in qualitative literature. Other terms, such as "trustworthiness," "authenticity," and "credibility" are used in qualitative studying instead of "validity" (Creswell, 2003, p. 196).

Validity refers to measuring what the researcher intends to measure (King et al., 1994). Sykes (1991) indicated

The main reason for the potential superiority of qualitative approaches for obtaining information is that the flexibility and responsive interaction which is possible between interviewer and respondent(s) allows meanings to be probed, topics to be covered from a variety of angles and questions made clear to respondents. (as cited in Saunders et al., 2003, p. 253)

Creswell (2003) presented eight approaches which are most frequently used to check the accuracy of the findings: triangulation, member-checking, rich and thick description, clarifying researcher biases, presenting negative or discrepant information, prolonged engagement, peer debriefing, and using an external auditor to review the entire project. The researcher used several of these methods to validate her research study.

*Triangulation.* Triangulation is the process of building coherent justification for findings by using different data sources (Creswell, 2003). In this research study, I used semi-structured face-to-face and telephone interviews to collect primary data. The comprehensive member check method was not carried out, but the researcher was always in contact with interviewees during the analyzing and finding procedures. Additionally, self-administrated questionnaires and documentary evidences supported and validated the findings.

*Member checking.* Using member checking is another procedure to determine the accuracy. In this method, the researcher seeks participants' feedbacks about the findings of the study by sending the final report or descriptions to participants (Creswell, 2003). As indicated earlier, I did not send any report to participants at the end of the study, but I was always in contact with respondents. After having interview protocols and questionnaires, I contacted some of respondents either face-to-face, or by telephone or e-mail. During conversations, I mentioned what I had found, and I sought additional interpretations from the respondents.

*External auditor.* I got an external auditor to review the entire project. Throughout the study, the external auditor and I frequently came together and discussed the whole project. The auditor was also a member of TNP. However, he was only a user of POLNET. Therefore, his evaluations on all parts of the research were objective and impartial.

*Clarify the bias.* I was significantly aware of possible interviewer biases. To overcome these biases, I gave additional attention to my questioning approach, listening strategy, and recording during the interviews. I also believe that it was not difficult to create trust with the interviewees because all are colleagues in TNP.

### 3.8 Protection of Human Subjects

As is the case in all social research, researchers can carry out surveys in either ethical or unethical ways. However, the researcher who conducts any type of research involving human subjects should be sure that no one suffers because of the results of the survey (Fowler, 2002). For this study, I, firstly, connected with respondents via e-mail to introduce myself and the objectives of the research. Then, I asked if they would be willing to participate through an interview.

Voluntary participation is the key in this study. No one was forced to respond to the questionnaire or interview. The most important issue of the survey is to protect the interviewees' right of privacy (Neuman & Wiegand, 2000). For this purpose, I do not reveal the identity of the respondents.

The purpose of the study, interview questions also were reviewed and approved by the Institutional Review Board (IRB) whose aim is to protect the rights and welfare of human subjects of research. Additionally, I also have the permission of TNP to conduct this research study.

### 3.9 Limitations

The biggest limitation of this study was geographical distance of the researcher to the study field. The potential respondents of this study are officers who are working in the Directorate of the Computer Department and the Directorate of the Communication Department. However, it was impossible to conduct face-to-face interviews with any of them. Telephone interviews were also impractical because of eight-hour time difference between Turkey and the US. Reaching them by e-mail was not possible due to the lack of a source containing all email addresses. As a consequence of these reasons, I decided to contact workers in those departments who are in the US pursuing their graduate degree. I had a chance to conduct face-to-face interviews with four respondents who are located in same city where the researcher resides. Another limitation of this study was that respondents said they have been far from the POLNET system for at least three years. However, they were very helpful in answering the research questions.



## CHAPTER 4

### RESULTS AND FINDINGS

#### 4.1 Introduction

This chapter presents results and findings based on the data analysis activities. It discusses themes and subcategories emerged from analysis of data that came from both semi-structured face-to-face and telephone interviews with experts of the POLNET system, self-administrated questionnaires completed by experts, and documentary evidences analysis. The analysis of data was handled elaborately in Chapter 3. I identified five themes based on data and will discuss the categories under those themes.

#### 4.2 Themes and Results

As mentioned earlier, the content analysis method was applied for analyzing collected data. I repeated the analysis steps until all segments/themes emerged and categories were placed under the relevant themes. Every part of the analysis steps was necessary to interpret data correctly. After analysis, five themes emerged. These are:

- A. Drivers of knowledge management
- B. Enablers of organizational environment
- C. Enablers of technological infrastructure
- D. Knowledge management processes

## E. Outcomes of knowledge management

In the following section, I discuss each of these themes and categories under the themes detailed. Because themes were constructed according to a model (the KM integrated model), parts of models were also discussed together with each theme.

### 4.2.1 Drivers of Knowledge Management

Based on interviews, questionnaire, and documentary evidences data, a set of four categories were identified under the theme *drivers of knowledge management*. These categories are:

- *Necessity of new system*: refers to the new information system because of insufficiency of the old one.
- *Necessity of access to information*: refers to the needs of officers to reach all required information.
  - *Criminal investigation*: refers to the necessity of gathering and sharing information for crime and criminal investigations.
- *Characteristic of information sharing*: refers to the demand of fast and secure information sharing.
  - *Fast information sharing*
  - *Secure information sharing*
- *Necessity of connection between police units*: refers to the network system among all police stations all over Turkey.

#### 4.2.1.1 Necessity of New System

According to analysis of data, 12 of 14 respondents mentioned insufficiency and ineffectiveness of the old mainframe information system to meet needs of the police organization. All the respondents agreed on the *necessity of new information system*. Accordingly, the old main frame computers did not have enough capacity to meet TNP expectations. It was limited to storing and sharing data. The new system would have to store a large amount of information, share it, and connect all the departments.

One respondent said:

TNP was using a mainframe computer system before POLNET. It was running very slowly and not widely used in the field. It was better than nothing. Mid-level managers of IT Department of TNP were closely following new developments in the field of IT. They realized that mainframe computer systems are going to be dead soon. That is why the TNP computer system should be rebuilt. The necessity of the new system and connection to all police stations were the main reasons for establishing POLNET.

Similarly, another respondent stated that:

Before POLNET, TNP used to have an old IBM based mainframe system for storing and sharing data. This old system had limited abilities to serve the needs of TNP, and maintenance and management of the system was very expensive. By the development in computer and network

technologies, the idea of developing a new computer network system was emerged during mid 1990s, and in 1997 POLNET project was initiated. The aim was to store and share the information needed by TNP in a secure environment.

Related to this category, another supportive answer was:

Before POLNET, TNP used to have an old IBM based mainframe system for storing and sharing data. This old system had limited abilities to serve the needs of TNP and maintenance and management of the system was very expensive. By the development in computer and network technologies, the idea of developing a new computer network system was emerged during mid 1990s, and POLNET project was initiated. The aim was to store and share the information needed by TNP in a secure environment.

#### 4.2.1.2 Necessity of Accessing to Information

According to data analysis, *necessity of accessing to information* was another driver for TNP to adopt the POLNET system. Eleven of 14 respondents mentioned how necessary it is to access information, especially for crime and criminal investigations. Related to the first driver, *necessity of new system*, respondents claimed that through POLNET, everybody has correct information.

Related to this category, one respondent said:

Comparing with the slow old connection lines and system crashed computers by being back of combating crimes, POLNET emerged as a

non-stop and continuously developing project. POLNET, fulfilling the communication infrastructure need of the Police Organization up to now, has been updated so as to facilitate faster access through capacity increase in the infrastructure in line with the technological developments and needs. POLNET is a comprehensive store of information, and it is providing a secure on-line aid to criminal investigation. Using modern technology, it enables police officers in the field to access national information via a police network.

Another respondent added, “To enable the police to access all necessary information easily and with in proper time frame in order to handle cases swiftly was the main reason for establishing POLNET.”

#### 4.2.1.3 Characteristic of Information Sharing

Sharing information is one of the most important drivers of POLNET. Every respondent was aware of the necessity of information sharing between departments. All 14 respondents mentioned the importance of information sharing between all units. Besides just sharing information, respondents also mentioned the necessity of secure and fast information sharing. Accordingly one respondent said, “the main goal of POLNET was to provide information is quick, easy, secure way.”

Another responded stated that:

Information sharing among police departments was the main drive to establish such a system. There were other reasons as well. Data from

different divisions were not interconnected in the old system. POLNET aimed to interconnect divisional data. The maintaining and upgrading costs of the old system was very high which made necessary to establish a new system with more capabilities.

#### 4.2.1.4 Necessity of Connection between Police Units

In general, in many parts of the world, local police have database systems used by their own personnel. Sharing information with other agencies has not been implemented sufficiently in the US. For example, after the September 11 terrorist attacks, it was proven that intelligence sharing was poor among the state and local levels. Knowing the importance of data sharing performance among the police units, 9 of 14 respondents in this research study especially focused on the necessity of connection between police units located all over Turkey. One respondent said, “connecting all province police departments with each other was the motivator behind the idea of POLNET,” and another mentioned that “POLNET is a National Police network that aimed to increase the level of collaboration among central and local police department.”

In summation, the first theme, drivers of knowledge management, was discussed. According to data, the first theme includes four categories: necessity of new system, necessity of access to information, characteristic of information sharing, and necessity of connection between police units. I discussed these categories with their subcategories such as crime investigation under the category of necessity of access to information, and fast and secure information

sharing subcategories under the category of characteristic of information sharing. Each category included supporting comments from respondents. This theme and its categories provided valuable information in answering Supporting Research Question 1 that is discussed in the next chapter.

#### 4.2.2 Enablers of Organizational Environment

Knowledge managers need to take into consideration that knowledge cannot be managed without giving attention to a set of organizational aspects such as organizational culture, leadership, and structure. All three of the organizational attributes should be designed to support the knowledge creation and sharing processes in the organization (Handzic & Zhou, 2005). In any business organization, leaders and leadership features, organizational structure, or even culture can be changed to reach successful KM applications. However, these kinds of implementations take shape according to existing organizational attributes in any governmental agency, especially in law enforcement. Policing, for example, is based on a high hierarchal structure. The important question is whether the organizational environment can be formed to reach KM processes more efficiently. This section gives place to respondents' thoughts about how the organizational environment affects the POLNET system in TNP, especially knowledge creation and sharing through POLNET.

Under the theme of organizational environment enablers, three categories were identified:

- *Organizational culture*: refers to unwritten rules, shared values and beliefs, and common assumptions such as isolation and solidarity.
- *Organizational structure*: refers to organizational chart, hierarchy, and centralized structure.
- *Leadership*: refers to leadership characteristics of managers.

#### 4.2.2.1 Organizational Culture

Organizational culture is one of the most important enablers of KM because efficient and effective KM implementation depends on organizational culture. If knowledge is a commodity or a competitive power, knowledge sharing generally does not occur voluntarily between employees. Thus, many organizations aim to establish an open culture environment where employees will create and share knowledge voluntarily (Handzic & Zhou, 2005).

Shanahan (2000) defined police culture as “something that exists from the perspective of the police officers who frequently deal with both criminals and the public as a part of his or her occupation” (p. 2). Occupational culture, according to a police officer, is his or her most meaningful standard of performance. The policeman compares himself with the ideal policeman which is described in police occupational standards. The occupational culture, however, is more than being a good policeman. It includes the values, norms, beliefs, and attitudes (Manning, 1999).

Isolation is considered the most fundamental cultural theme in policing (Kappeler, Sluder, & Alpert, 1999; Crank, 2004; Van Maanen, 1999; Manning,



1999). Isolation means that the police separate themselves emotionally and physically from the rest of the society. This attitude makes relationships between police and citizens problematic (Kappeler et al., 1999). Some common assumptions about everyday life also support this occupational culture. Manning (1999) indicates these assumptions as (p. 99):

1. People cannot be trusted; they are dangerous.
2. Everyone hates a cop.
3. You must make people respect you.
4. People who are not controlled will break laws.
5. Policemen must appear respectable and be efficient.
6. The major jobs of policemen are to prevent crime and to enforce laws.
7. Stronger punishment will deter criminals from repeating their errors.

Solidarity is the second apparent theme in police culture (Kappeler et al., 1999; Crank, 2004; Van Maanen, 1999; Manning, 1999). Solidarity emerges among police officers based on sameness of roles and perceptions. This is very natural because officers spend their entire life among colleagues by being involved in either police work or social activity. Crank (2004) defined police solidarity as the “mask of thousand faces” (p. 237). Police solidarity takes different faces such as “loyalty, cohesiveness, fealty, honor, brotherhood, the blue curtain” (Crank, 2004, p. 237). Police officers learn solidarity at the police

academy and in-service trainings, and it is transmitted informally through years of service (Crank, 2004).

Isolation is one of the most dominant characteristics of police culture in Turkey. Isolation of the police from the public starts with their education and continues through their profession life in formal police practices. For example, police students do not have any regular contact with citizens until they graduate from the school. After graduation, they contact civilians only in occupational-related aspects. They rent or buy houses in certain areas to be close to each other, go to police canteens for their needs, and send their children to police crèches which are established to care for children of the police. Even their spouses frequently befriend their colleagues' spouses (S. Gultekin, 2005).

Solidarity, as well as isolation, is another powerful aspect of police culture in the TNP. Throughout the training process, solidarity is emphasized frequently and strongly. S. Gultekin (2005), one of the members of TNP, explained solidarity during his training process as:

In general, expectations require cadets to adopt every practice all together, and any individual trainee who breaks the solidarity is punished. Furthermore, students are divided and classified according to their admission to the schools. For example, the author of this study was among the "91 incomers," which refers to his entry to the NPC in 1991. The students can communicate with only their friends who arrived at the school at the same time. Speaking with incomers from different terms is restricted. Students lodge at the same dormitory. They watch television at the same recreation place, and they eat their breakfast, lunch, and dinner all together. Even on days off they go to the recreation room where they may stay in touch with their same-term friends. In addition, same-term incomers are taught the same marches, which are different from those that are taught to incomers in other terms. (p. 52)

In the same way, police in daily practices behave and act in solidarity. In their professional life, police officers are likely to protect their colleagues from judicial and administrative responsibility. Regardless of whether or not they violate the law, it is common and expected practice among police officers to protect a coworker (S. Gultekin, 2005).

Going back to survey answers under the light of police cultural knowledge, I found 10 responses supporting cultural themes saying either organizational culture affects information sharing either positively or negatively. Two of them indicated solidarity has positive effect on information sharing. For example, one respondent commented on whether or not the culture of TNP supports information sharing, "The major motive of information sharing and innovation is the subculture among the badge mates (graduates of the same year), among the same police college graduates, and among the graduates of police academy (university)," and another one added, "TNP members are very good friends and they know they serve to the public. To serve better, they help each other." These two answers show how solidarity among police officers affects information sharing positively.

Similarly one comment showed that isolation supports information sharing. He said, "I think the feeling of sameness (I am talking about intra-departmental relations, not about inter-departmental relations) and the feeling of being a part of same organization makes it possible."

On the other hand, 5 of 10 respondents said organizational culture affects information sharing negatively. One respondent commented:

I think in the culture of TNP, we have some problems about sharing of data such as prejudice, yet new generations more tolerant than the old generations. Generally, chiefs do not like some innovations and technology. To tell the truth, they are afraid of sharing the data. Besides, bureaucracy does not allow departments to distribute the data.

Another respondent discussed that:

Although different departments of TNP create knowledge and share it with each other, creating and sharing knowledge does not occur in a systematic way as a part of the organizational culture. There is a lack of trust between different departments and each department wants to keep the information and knowledge.

Two of 10 respondents evaluated this question from a bigger perspective. One of these respondents said, “[The] department is increasingly becoming one server in a network of servers, providing national information to every police officer wherever it is needed. And TNP supports with consistency, reliability, scalability, secure interconnection with members and other agencies for collaborative working.” Another respondent believes TNP officers are open for new technological advancements. He stated, “Information sharing is not a well established subculture not only in TNP but also in any government agency in any country. But it can be said that TNP is an open agency for innovations.” These

two respondents also mentioned some obstacles that cause information sharing problems. These barriers are confidentiality, security, privacy, lack of responsibilities, and lack of trust in other agencies.

On the other hand, 2 of 14 respondents did not connect organizational culture with information sharing through POLNET. Comments from different respondents included that, “personal experience and knowledge was not shared too much. But the information shared on POLNET is regulated by laws. Therefore, people have to share it. Data sharing on POLNET is not related to police culture” and “information sharing is a must for law enforcement agencies. Fighting against crime and crime prevention mainly relies on information sharing.”

The remaining two answers did not mention organizational culture. Instead, respondents talked about whether or not information sharing occurs easily and effectively. One respondent said:

Personally, I see problems about information sharing. It would be so idealistic to accept that TNP supports information sharing and innovation. It is kind of sharing success, but I think, individuals in TNP are not really ready for this. Policing is still a very competitive occupation in Turkey. Another added, “sharing success is not an easy task, concerning about data security.”

#### 4.2.2.2 Organizational Structure

Like the importance of organizational culture and information technologies in the process of knowledge creation and sharing, organizational structure plays a significant role, perhaps more significant than those previously mentioned. It is obvious that team-based, networked, and systematic organizational structured environments are more supportive to knowledge creating, sharing, and collaboration than bureaucratic structures where hierarchies and command and control over employees discourage innovations and knowledge sharing (Handzic & Zhou, 2005).

The Turkish National Police operates under the Ministry of Internal Affairs. In the province, TNP operates under the command of the governor. As can be seen appendix A (Organizational Chart of the Turkish National Police), TNP is composed of both central and provincial organization that includes 81 Directorates of Provincial Police, 751 Police Directorates of Towns affiliated to Provinces, 22 Border Gates Directorates, 18 Free-Zone Police Stations, and 834 Police Stations in 81 Provinces (Organization for Security and Co-Operation in Europe–OSCE, 2007).

The Turkish police have a highly centralized structure. The Ministry of the Interior is the highest authority. The General Director of Security, the head of the police organization, is appointed by the Minister of the Interior. Both the General Directorate (central) and provincial organization mentioned previously work under the command of the General Director of Security (R. Gultekin, 2005).

Table 4.1

*Personnel Information of TNP*

Management Level	Ranks	Total
Command level personnel	Chief Superintendent – Beyond Class	1
	Chief Superintendent – First Class	842
	Chief Superintendent – Second Class	591
Middle level management	Chief Superintendent – Third Class	850
	Chief Superintendent – Fourth Class	888
	Superintendent	2484
First level management	Captain	3295
	Lieutenant	2698
	Sergeant	2153
Line level personnel	Police Officer – Constable	167083
Grand Total		180884

(Durmaz, 2007)

As a hierarchical structure, administrative ranks start with the rank of deputy inspectorship (sergeant) after graduation from the Police Academy. Inspectorship (lieutenant), chief inspectorship (captain), superintendentship and directorship follow in order. Having more than 180,000 (Durmaz, 2007) officers, TNP is a large national police system organized all over the country. Table 4.1 provides numbers in each rank in TNP.

Respondents who answered questions about POLNET for this study drew attention to both categories: the centralized and hierarchical structure of TNP. Two of 14 respondents did not answer this question. Five of rest of the 10 respondents asserted that organizational structure encourages information sharing, participation, or collaboration among members of TNP while five others claimed the opposite. For example, one respondent commented, “Organizational structure may affect in a positive way since TNP is a centralized agency. If top level officials want to implement a new policy, it is easy to implement comparing to decentralized structured police organizations” while another respondent said, “Since TNP organization is centralized, and orders are coming from top to below, sometimes the police officers who work as a lower ranked face some problems related with knowledge sharing through POLNET.”

In terms of hierarchical structure, one respondent said hierarchy affects knowledge sharing positively: “We have strong organizational structure and hierarchy among the police departments in Turkey. Hence, the strong hierarchy facilitates the knowledge sharing through the POLNET.” Contrarily, another respondent said, “It depends on who the superiors are, but, mostly it discourages.”

The remaining two respondents stated that the organizational structure of TNP sometimes encourages KM processes and sometimes does not. Examples of this statement include following comments:



I think the organizational structure of TNP somewhat encourages collaboration and in some degree discourages. Some operations, investigations and analyzing process have to be done by different departments and agencies, and they collaborate in some degrees. Every user has online access to information only in some degrees. There must be coordination between these agencies and organizational structures.

In addition, “Generally it encourages participation but in some ways it could discourages. The head of departments sometimes try to achieve their own projects and reject to integrate other departments solutions.”

Another question related to organizational structure was whether there are any differences among the various ranks (from police officer to high-level administrator) in terms of involvement in information processes through POLNET. Answers showed that different ranked officers acted differently in terms of the information process through POLNET. However, there is no consistent result for this question. Three of 14 respondents did not answer this question. Among the remaining 11, six of the respondents claimed low-level officers are more likely to participate in information sharing while the other five respondents asserted the opposite.

The answers that supported the idea of the willingness of low-level officers in information sharing are given in following statements: “Police officers and low level administrators are more willing to information sharing than high level administrators” and “Higher rank officers generally do not know how POLNET

works and what kind of information is processed on POLNET in detail. Lower level of officers generally put in the information and they search and processed information. So, they well know about POLNET.”

Additionally, another respondent commented, “I guess there should be some differences. Based on my observation, lower level administrators and officers are more willing to involve information process than middle and high level administrators.”

Opposing ideas were also stated:

Since police administrators have more responsibilities than police officers do, police administrators have more tendencies to attend knowledge processes than police officers through POLNET. On the other hand, there are no restrictions for police officers to reach the knowledge processes through POLNET.

In agreement, a responder replied, “Those who are higher ranks are highly involved in the information process. They have much more user rights.” Another commenter agreed, “Actually, it depends on understanding the system, but in general, high-level administrators are more interested in the system.”

#### 4.2.2.3 Leadership

The adoption and implementation of KM in an organization require managers with strong leadership characteristics to utilize knowledge resources efficiently. Handzic and Zhou (2005) stated the distinguishing characteristic of leadership as a:

Catalyst through inspiring, mentoring, setting examples, listening and endanger trust and respect. KM requires individuals and teams leaders with a diverse range of skills, attributes and capabilities to manage and motive change. These include strong interpersonal, communication and change management skills, an understanding of the business, technological expertise and the ability to build relationship. (p. 36)

Respondents were asked what kinds of characteristics leaders should have to support information management through POLNET. Two of 14 respondents did not give an answer. The following quotes include several answers from the remaining 12 respondents:

- “Characteristics should be transparent, openness to new innovations, openness to technological advancements.”
- “They should be open to new innovations, take responsibility in necessary conditions, have good relations with other agencies, trust to his personal, and have vision for new projects.”
- “They should be open. They should have strategic plans for their departments. That is, they need goals, mission, vision, and etc. They need to have team work approach. In this case, they are not afraid of sharing information.”
- “Leaders should have at least basic understanding of the technology and how it can be used. S/he should support the new ideas and improve the creativity of the individuals. S/he should be open to communication and support to team work within the department.”

- “In order to support KM through POLNET, leaders should be open-minded, tendentious to new developments, and understandable.”
- “First of all, they must be open-minded so they are not afraid of innovations and changes. Then, they must trust their subordinates who are well-prepared to their cases.”

Another question asked was whether those characteristics of managers in TNP affect information sharing through POLNET. With the exception of one respondent, 13 respondents stated that management skills of department’s chiefs directly affect the KM processes:

- “I think that their management performance is very important. Their vision, duties and relationships with other agencies affects information sharing process.”
- “Since TNP is a kind of centralized organizations, departments’ chiefs have more power on TNP organizations. For this reason, the management skills of departments’ chiefs affect knowledge sharing through POLNET. For example, recently, some of TNP departments have used POLNET as an education and training tools. In this way, police officers working in different part of the country do not have to come to the capital city of Turkey for training. They can do the same job in their region over POLNET. However, some police administrators do not believe the importance of training held over POLNET. For that reason, some police departments haven’t used this kind of education tools.”

- “Absolutely, skills are the most important thing affecting knowledge sharing. Officers do not want to work under pressure and they want to feel free instead of working with afraid. With some certain rules about using of POLNET, officers’ performance and satisfaction can be increased. In this manner, the skills of managements are effective.”

The final question concerned how respondents evaluate attitudes of top-level police administrators in establishing POLNET. One respondent did not answer the question. Among the remaining 13 respondents, six of them stated that the administrators were very supportive of POLNET because they knew the old system was unsuitable for information sharing. Some comments from different respondents were:

- “Top level officials were very well receptive for establishing of POLNET.”
- “There was no significant negative attitude among the top level executives. It is because the A Series system without doubt became too old and inadequate to response the needs of TNP.”
- “Most of them are agreed to have POLNET project and supported its establishment and innovation.”
- “POLNET has been supported by top level administration. They are aware of the importance of the information sharing and how computer technologies help to the TNP to do its regular police works and increase the security of citizens.”

Four respondents said at the beginning, top-level administrators were suspicious of POLNET. However, after understanding how POLNET is useful for TNP, they were supportive. Two of the four responses were:

- “At the beginning, there were some rejections against POLNET. After they saw POLNET works, they were persuaded. Now I can say that top level police administrators have good feelings about POLNET.”
- “We, with the experts working in computer network firms, explained what POLNET would contribute to the Turkish National Police. After that, they were supportive.”

One respondent stated how difficult it was to convince top-level administrators to accept POLNET; “It was my department’s directors’ and managers’ job to convince top level ones about the need of investing on technology towards fighting against crime better, which I think was not so an easy job.”

Two respondents discussed the general attitudes of administrators. They claimed that being supportive of administrators depends on how knowledgeable the administrators are about technology. One respondent said, “It depends on the background information that top level police administrators have about technology and computers. Police administrators, who have enough knowledge and tendency to the technologies and new developments, try to do whatever they do.” Another responder stated, “Actually, we face two different top level police administrators, the first group is open-minded for technology and they support it.

On the other hand, the other side does not like innovations. Hence, the attitudes are different depending on individuals.”

#### 4.2.3 Enablers of Technological Infrastructure

Today, the importance of technology cannot be denied. The role of IT in KM is emphasized, however. For many years, organizations have considered the IT issue as KM, but they have discovered that not only is KM related with technology, it is a mixture of organizational structure, culture, strategic objectives, and technology (Handzic & Zhou, 2005).

IT has an important role in facilitating the KM process including creation, storage, transfer/sharing, and application practices (Alavi & Leidner, 2001).

There are many examples showing the benefits of using IT in a business environment. For example, IT is used for teleconferencing, virtual teaming, e-mailing, connecting people who work in different geographic areas, and so on (Handzic & Zhou, 2005).

The police are an information-dependent organization. The police collect diverse types of information and use them to increase their service, respond to citizens' calls, and combat crime. IT is used in the police organization to provide more effective and efficient service to public. IT helps the police organize a wide amount of information, facilitate reaching, reusing, and sharing knowledge, and decrease work loads (Manning, 1992).

POLNET is built on information technologies. The role of POLNET is to allow information and knowledge transfer among all units of the police

organization. Additionally, respondents' answers show that POLNET has a wide spectrum of information management technologies. They are knowledge databases, text-bases, yellow pages, search engines, e-mail system, groupware, voice mail, electronic bulletin boards, electronic forums, web-pages, statistical tools, graphical representation, video conferencing, workflow systems, and data mining.

#### 4.2.4 Knowledge Management Processes

KM is a continuous set of processes and practices (Alavi & Leidner, 2001). Scholars have suggested a number of classifications of KM processes. For example, Grover and Davenport (2001) categorized knowledge processes as generalization, codification, transfer, and realization, or Choo (1998) has given the labels needs, acquisition, organization and storage, distribution, and use. Oluic-Vukovic (2001) gave different names: gathering, organizing, refining, representing, and disseminating. Alavi and Leidner (2001) noted that there is no major conceptual differences between these classifications schemes; the one difference comes from numbering and labeling of processes.

After analyzing data, three categories were identified in this theme based on the interview and survey data. These categories are:

- *Knowledge conversion*: refers to the constitution of new knowledge by developing and replacing the collective knowledge.



- *Information storage/retrieval*: refers to storing, organizing, and retrieving information in different forms, such as written documentation, codified information, or procedures.
- *Information sharing/transfer*: refers to distributing the right information to the right officers in quick and secure way.

#### 4.2.4.1 Knowledge Conversion

Data analysis showed that four of the 14 respondents did not answer this question. Three respondents said all of these four knowledge conversion methods have been used through POLNET. For example, the police socialize with people to collect information (socialization), enter this information into databases (externalization), enrich this information with related information (combination), and use new knowledge in coming operations (internalization).

The remaining three respondents mentioned that the socialization and combination processes are the main knowledge conversion methods. One respondent simply said, "Socialization and combination are used as a conversion method through POLNET." The remaining two identified by using examples: "Criminal data is gathered through police daily contact with criminals and stored into the POLNET system (socialization). Statistical data is gathered through the existing data (combination)" and "Socialization and combination methods are generally used. This information generally comes from police incident reports and crime scene reports."

Two other respondents said the combination method is the most common method: "Combination method is used because the data on POLNET are generally related to crimes, suspects, victims, guns, and vehicles" and "POLNET system is trying to rearrange existing knowledge to be accessed widely all around the country."

Some respondents said new knowledge is not created through POLNET because of the nature of the information. One respondent mentioned, "Creating new knowledge is not a usual activity that happens through POLNET." Another added, "That comes from police incidents and crime scene reports."

On the other hand, two respondents mentioned that socialization is the main knowledge conversion method in terms of teaching new users how to use POLNET. One respondent mentioned socialization occurred during the establishment of the infrastructure of POLNET. He explained that he and his colleagues went to different departments, spent time with officers who worked there, and learnt what they needed to put in the POLNET system. After this socialization step, team members constituted POLNET software based on knowledge they gained through socialization with other officers, which can be classified as the externalization process.

#### 4.2.4.2 Information Storage/retrieval

Under this category, respondents answered the question concerning what kinds of databases POLNET has to store information. All respondents gave

similar answers that are the same as “programs used within the POLNET system” stated in Chapter III. The most comprehensive answer was:

AFIS (Automated Fingerprint Information System), KPL (Criminal Police Laboratories Information System), PBS (Personnel Information System), EmisNet (Police Intelligent Service Information System), TBS (Traffic Information System), PEBS (Police Electronic Information System), stolen vehicles, fingerprints, vehicle owners, criminal names, wanted/missing persons, disqualified drivers, firearms records, public security. As an example, you can find data by detecting of vehicle theft offenders through the vehicles database, and of criminals through the criminal records database. It also houses important data about terrorists, organized crime groups etc.

#### 4.2.4.3 Information Sharing/transfer

POLNET is a technology-based system. For this reason, information sharing occurs through impersonal transfer such as knowledge repositories. When respondents were asked how information was transferred through the POLNET system, all respondents made similar comments. A representative comment was:

The Turkish Police network connects over 1000 locations each other, which constitute 81 city centers, 88 border gates and some other small units. Organization for telecommunication infrastructure is on LAN and WAN computer communication over secure private lease line with

telephone switchboard network, voice over frame relay or v oip, transmission of image and voices from the crime scene, data transmission for automated fingerprint identification system, and transmission of image and information.

#### 4.2.5 Outcomes of Knowledge Management

In general, the ultimate goal of KM is to produce and add value to organizations by manipulating their existing knowledge. The benefit of organizations depends on how they implement successful KM strategies (Handzic, 2004; Handzic & Zhou, 2005).

Under this theme, two categories were identified according to the data:

- *Result of POLNET*: refers to the products of POLNET.
- *Effects of results to service delivery*: refers to effects of outputs of POLNET on inputs.

##### 4.2.5.1 Result of POLNET

The question concerning what results POLNET produces was given to the respondents to understand the outcomes of the POLNET project. All respondents made similar comments stating that POLNET has facilitated regular police work and made work faster. Respondents also stated that POLNET increased communication with TNP members. Several responses were:

- “POLNET makes easier and quicker regular police works by allowing easy access to all databases. For instance, it makes easier criminal investigation by allowing reaching all needed information for a criminal

case, such as fingerprints, vehicle registration, driver license or passport information. Moreover, it reduces the bureaucracy by allowing to rapid access data and information in an electronic environment. For instance, before POLNET, issuing a passport took a week or more because of bureaucratic procedures. Now, although bureaucratic procedures have not been changed, it takes several hours to issue a passport.”

- “POLNET not only facilitated the duties of police officers but also helped the public about their implementations related with government. For example, people had to wait at least couple of days in order to get their passports, now they can receive their passports at most in a day with using the infrastructure of POLNET. POLNET caused to create the knowledge sharing among police. While police databases in different departments and cities were separated from each other, POLNET provided some software programs that allowed queries from all databases at the same time.”
- “Throughout Turkey, there are 305 server computers working 7 days 24 hours a week. Starting with intelligence, personnel, traffic, order and criminal lab units, the police organization make all applications based on information technologies in a fast and secure way by using POLNET. POLNET is the leader in its field and the smiling face of our police because now the citizens are able to make their proceedings far from

bureaucracy, at home. Now innocent people are not treated unjustly while looking for the guilty.”

- “POLNET increased the communication within TNP members. POLNET also helped to save money because of conducting most of the works electronically.”

#### 4.2.5.2 Effects of Results to Service Delivery

Another question was if the results of POLNET usage affect service delivery. All respondents gave similar answers. A representative was:

The system provides online reliable, secure and rapid communication service in all cities and border gates on the basis of its main elements.

This service delivery helps to improve more solutions for challenges according to inputs. Output of reducing crime clearance rate and effective crime fighting strategies will force departments to produce more and more new techniques to combat criminals as an input.

#### 4.3 Summary

This chapter presented the themes and categories that derived from the analysis of semi-structured face-to-face and telephone interviews with experts of the POLNET system, self-administrated questionnaires, and documentary evidences analysis. The following five themes were identified based on data analysis:

- A. Drivers of knowledge management
- B. Enablers of organizational environment

C. Enablers of technological infrastructure

D. Knowledge management processes

E. Outcomes of knowledge management

Under these outcomes, the answers of respondents were presented according to the categories. Results are discussed in the next chapter.

## CHAPTER 5

### DISCUSSION AND CONCLUSIONS

#### 5.1 Introduction

This research aimed to understand which KM strategies were implemented during the establishment of POLNET in the TNP and offer a KM model to the POLNET project. To achieve this goal, this study used Handzic and Zhou's (2005) model of KM and compared this model with the KM strategies of POLNET. As a result, this research study suggested some adjustments to the integrated framework model of KM (Handzic & Zhou, 2005). Six questions, one major and five supportive, were proposed in this study to understand similarities and differences between Handzic and Zhou's (2005) model of KM and the KM strategies of the POLNET system. These questions were:

- MRQ: Do KM strategies of TNP match with KM integrated model?
- SRQ 1. Which drivers triggered the POLNET project?
- SRQ 2. Do organizational culture, structure, and leadership features affect on the POLNET system?
- SRQ 3. What is the technological infrastructure of the POLNET system?
- SRQ 4. What are KM processes of the POLNET?
- SRQ 5. Do outcomes of the POLNET system affect drivers?



This chapter is compromised of the following parts. The researcher discusses, first, the research findings; second, answers to the research questions; third, the conceptual KM model for the POLNET system; fourth, implications of this study for other research and practice; fifth, recommendations for future research, and last, conclusions.

## 5.2 Discussion of the Findings

According to data coming from interviews, the researcher presents six findings. Each finding is followed by an explanation and supportive quotes from respondents. These findings are:

### Finding 1:

POLNET is an infrastructure and software system, and its aim is to enable fast and secure information storing, accessing, and sharing among all units; and increase the level of collaboration and communication among police departments and between the police and public.

POLNET is defined as a modern information system through which the police can reach any information related to duty in a fast, easy and secure way. It is one of the most important projects that helps Turkey be an information society. POLNET was designed to be integrated into all national and international information webs and databanks. Through POLNET, custody time is decreased, traffic controls are accelerated, citizens' access to traffic fines and passports is immediate, and the wait for driving and vehicle licenses is shortened (<http://www.egm.gov.tr/bilgiislem/demo/3/polnet.html>).

Pekgozlu (2003) states aims of POLNET:

1. To present information administrators need,

2. To provide information that is used in decision making,
3. To increase efficiency and effectiveness of service,
4. To decrease process time and cost,
5. To follow processes through computer,
6. To keep all information in databases,
7. To increase relationships between citizens and the police,
8. To provide direct and secure information exchange with other countries' police forces,
9. To inquire about crimes, criminals, where crimes occur, or where criminals get caught,
10. To declare all notices, announcements, and correspondences through the system without consuming time (p. 107).

Respondents of this research study generally gave the same comments.

One respondent's comment included all other responses. He said:

POLNET is the abbreviation of the "Police Network" that defines the Turkish National Police's (TNP) nationwide computer network that facilitates administrative, investigative, tactical, and statistical information for police and other law enforcement agencies in Turkey. In this regard, POLNET could be viewed as both simply the computer network of Turkish National Police as well as the information infrastructure. That is, POLNET means both the infra-structure of computer technologies and the information systems in Turkish National Police.

Information Technologies Department under the General Directorate of Security (GDS), Ankara, is the department that developed the POLNET and is responsible and holds the main authority for the maintenance and functionality of the system.

The main objective behind the POLNET is to apply the capabilities of contemporary information technologies into the TNP which will eventually advance the capacity of TNP members in their duties. That is, POLNET's main goal is to provide a fast, online, and secure computer network for police agencies that will allow them to share their data and make communication with other police departments and divisions nationwide. The data include but not limited to crimes, offenders, victims, terrorists, terrorist groups and their activities, motor vehicle registration records, citizen's passport and driver's license records and so on

Finding 1 has direct connection with Finding 2 because the aims of POLNET also constitute fundamental drivers in establishing POLNET.

Finding 2:

The most influential drivers in establishing POLNET were recognizing the insufficiency of the old system and the necessity of a new one. Thus, to respond to criminal activities by a more efficient and faster way, accelerate time for other duties such as providing driver licenses, gun licenses, and passports to citizens, and allow fast and secure information sharing among departments all over Turkey support the main drivers for POLNET.

Global trends such as globalization, transformation from the traditional industrial economy to a knowledge-based economy, and digitalization are considered main forces in driving KM. These trends yield complexity, uncertainty, and surprises for big organizations. These factors also require organizations to manage knowledge effectively (Handzic & Zhou, 2005).

Global trends do not require only business organizations to manage their knowledge efficiently, but also governmental organizations affected by those trends need to be aware of their knowledge, and know how to get benefits from data. The police organization, as a governmental organization, needs KM even more than other organizations do.

As indicated in Chapter 4 (see section 4.2.1), the necessity of a new system, the necessity of accessing information in a fast and secure way, and the necessity of connection between police units were major drivers. Before POLNET, the old mainframe system was used. However, this system was not sufficient to meet the new requirements that the police organization needed. Operation and maintenance of this system was also very expensive. Furthermore, database and software used in this system were designed independently from each other. Because of these negatives, it was impossible to form an integrated database and reach the desired data (Askan, 2007).

Therefore, the establishment of a new information system was necessary.

Pekgozlu (2003) also stated the obstacles of the system:

1. It was not sufficient to deeply analyze large amounts of information collected by the police,
2. Time for accessing information was exceedingly long,
3. Data could not be instantly updated,
4. Accessing information and evaluating it, giving reports, corresponding, and organizing documents used to a great deal of time. Therefore, the efficiency of the job decreased (p. 111).

As understandable from respondents' answers given in Chapter IV, old mainframe computers were not simple and friendly to use and did not allow users

easy access to information. However, there is no doubt that information access is vital for police work. Contrary to the common assumption that the first duty of the police is to catch criminals, the first responsibility of the police is to prevent crime. Over the past 10 years, the police have turned from reactive to proactive (Collier, 2006) police activities. Therefore, it is more important for police to prevent crime rather than respond to recorded incidents. To have a preventive power against crime, officers need to have access to accurate and up-to-date information. Data results support this opinion.

On the other hand, accessing information itself is not enough. For example, the first reaction of a person after committing crime is to escape. Under normal circumstances, if 72 hours pass after the incident, it would be very difficult to explore the case and catch the criminal. Therefore, information should be shared to inform other officers about the incident, help them reach the same data, and facilitate their job. For this reason, accessing and sharing information in a safe environment and in a short amount of time has gained importance.

Finding 3:

Organizational culture, the structure of the organization, and leadership characteristics of administrators affected the establishment of the POLNET system and information sharing through POLNET.

Generally, a culture characterizes a particular group that has the same system of beliefs, ideas, customs, assumptions, expectations, mores, traditions, and values that determine how a group of people behave (O'Toole, 1995).

Likewise, organizational culture also refers to set of values systems that teach

firms how to recognize and respond to their environment (Kayworth & Leidner, 2003). Denison and Mishra (1995) explored the relationship between organizational culture and effectiveness by focusing on four traits of organizational culture: involvement, consistency, adaptability, and mission. Results show that both involvement and adaptability indicate flexibility, openness, and responsiveness as strong factors of growth. The other traits, consistency and mission, are better predictors of productivity, designating integration, direction, and vision. Results also show that those four traits are important criteria for the effectiveness of organizations.

The police organization, unlike any other business organization, has its own culture. In terms of police organizational culture, there are many comprehensive discussions in literature (Crank, 2004; Harrison, 1998; Herbert, 1998), mainly focusing on the same cultural characteristics of policing such as solidarity, isolation, and authority. The majority of the literature, however, discuss that those concepts of organizational culture yield police deviant behavior (Kappeler, Sluder, & Alpert, 1998).

Isolation of the police, for example, from previous friends, community, and the legal system is considered the most dominant characteristic of police culture/subculture. This “us/them” perspective is engrained into police since they step into the organization. Because of the nature of police job, everyone who is an outsider (non-police) may be dangerous and needs to be watched. Even in the organization, the police learn to isolate themselves from the rest of their

colleagues. Common postulates that support police isolation are “protect your ass,” “don’t trust a new guy until you have him checked out,” “don’t talk too little or too much; don’t tell anybody more than they have to know,” and “don’t trust bosses to look out for your interests” (Kappeler et al., 1998, p. 105-106).

Another theme in the police subculture is solidarity. Traditionally, the reasons for police solidarity and loyalty were seen as a result of isolation from the community and perception of the dangers of the police job. Brown (1981) stated the reasons for police loyalty are protection from the hostile public, safety from aggressive administrators and supervisors, and emotional support for performing difficult tasks. Ferdinand (in Kappeler et al., 1998), however, noted that solidarity and loyalty change according to officers’ rank and age. Solidarity increases among new members and lower-ranked officers, while it decreases among those who move into higher rank and position. Solidarity among the same-ranked officers and isolation are often criticized as the reasons for police deviant behavior. However, at the same time, these subcultures provide organizational cooperation and teamwork (Harrison, 1998).

Leadership skill is another critical area in police organization. A good leader has the ability to lead, supervise, and motivate subordinates, while at the same time having respect for them and developing a good relationship with them. According to Alpert and Dunham (1997), “Human relation skills, conceptual skills, and technical skills are three major requirements for good leadership” (p. 97). Police authority, which is another largely accepted and important themes of

police occupational culture, is different than leadership, yet somehow a related concept (Kappeler et al., 1998; Crank, 2004; Van Maanen, 1999; Manning, 1999). Authority comes with power, which is “the force behind the authority” (Kappeler et al., 1998, p. 240).

According to the analyzed results of data, all respondents, except one, accepted that organizational culture and leadership directly affected the establishment of POLNET and information sharing through POLNET. However, some of them thought that organization culture affected information sharing positively, while others asserted the opposite view. For example, officers who graduated the same year and were good friends had increased information sharing. From a different view, responses revealed that information sharing willingly occurred in the same department. However, there were some problems among different departments in terms of knowledge sharing. Leaders have an important role in this stage because an effective leader should increase the level of trust among departments and allow information sharing to occur easily. Data showed that information sharing occurred more easily among middle-level administrators than high-level administrators because solidarity and loyalty were mostly seen among these groups. Additionally, middle-level administrators’ knowledge about technology is higher than high-level administrators and unranked police officers. Being knowledgeable also affects information sharing positively.



Some ambiguity that organizational culture affected information sharing through POLNET both positively and negatively emerged. Inherently, TNP is a highly centralized and hierarchical organization. According to several respondents, this hierarchical structure encouraged information sharing, whereas others argued that information sharing decreased because of the structure of TNP. Supporters who maintained that structure negatively affected information sharing said that the size of TNP had a negative effect because it was difficult to keep relationships. Another respondent said the hierarchical structure caused a delay in innovations.

I stated all related respondent answers in Chapter 4 (see Enablers of Organizational Environment).

#### Finding 4:

The main component of the POLNET system was information management technologies.

This finding concentrates on technological aspects of KM strategies of the POLNET project. Davenport and Prusak (1998) asserted that knowledge management includes organizational, human, and technical issues. Thus, it is much more than technology, but “techknowledge,” and it is an important part of KM (p. 123). Information technology also plays an important role in police investigations as supportive tools for KM in a police environment. Gottschalk and Holgersson (2006) found four states of KM technology that the police want during investigations. These are:

Stage I: Officers-to-technology/End-user tool system – Use of IT tools that provide personal efficiency; e.g. word processing, spreadsheets, presentation software, etc.

Stage II: Officer-to-person/Who-knows-what systems – Use of IT to find other knowledge workers; e.g. intranets, yellow pages system, e-mails, staff profiles, etc.

Stage III: Officer-to-information/Who-they-know systems – Use of IT to provide access to stored documents; e.g. databases, contracts, articles, photographs, reports, etc.

Stage IV: Officer-to-system/How-they-think systems – Use of specific IT systems designed to solve a knowledge problem; e.g. expert system, business/criminal-security intelligence, etc (pg. 185).

Of course, not all stages have the same impact on investigation performance. Edwards, Shaw and Collier (2005) find that there is no “one size fits all” solution to use of information technologies as a supportive tool of KM in organizations. In police organizations, increasing quality of information management technologies are being adopted and this equipment and empowerment enable the police to achieve a high level of successful and satisfaction in their duties (Gottschalk & Holgersson, 2006).

POLNET, as a tool, includes KM technologies. The KM systems the respondents most frequently mentioned were databases, text-bases, data warehouse, knowledge maps, search engines, e-mail systems, electronic bulletin

boards, whiteboards, videoconferencing, groupware, data mining, statistical tools, graphical representation, internet, intranets, extranets, and portals.

Finding 5:

Throughout establishing the POLNET system, and later when using POLNET, both establishers and end users had articulated different kinds of knowledge and adopted different knowledge conversion methods.

Giving one definition of knowledge is very difficult and it is certainly not enough to cover a complex and ambiguous concept. Therefore, management of knowledge is not a one-sided approach. Knowledge should be considered from multiple perspectives.

The most common perspective is a hierarchical view of data, information, and knowledge. From this view, knowledge is at the top of the hierarchy.

O'Connor (1996) asserted that data is raw material and generally "taken as the beginning of the progression" (p. 7). He added that "information is an accepted internal picture of the world, whereas knowledge is the successful use of internal pictures" (p.8).

Holsapple (2003) presented another perspective, "Stocks and flows" (p.168). Knowledge stocks are considered inventories of knowledge that are available to one or more processors. An organization develops knowledge stores and captures the organizational knowledge by using information technologies. Flow is the movement of knowledge across stocks or within stocks to produce new knowledge. During this process learning occurs.

Two different kinds of knowledge, tacit and explicit, are presented as another perspective of knowledge. Nonaka (1991) defined tacit knowledge as personal knowledge that is constituted by a person's mental model, beliefs, and perspectives. It is highly contextual and hard to articulate. Explicit knowledge, in contrast, is defined as being codified and stored in databases. Thus, it is easily communicated and shared.

Other perspectives have been interpreted as knowledge states (Holsapple, 2003), thing versus human (Handzic & Zhou, 2005), individual versus group (Handzic & Zhou, 2005), propositional versus perspective (Mokyr, 2002), and good versus bad (Mokyr, 2002). Regardless of the category, all kinds of knowledge should be considered an organizational asset and utilized at maximum levels.

Throughout establishing the POLNET system, in recognizing the insufficiency of the old system and the need for a new one, police administrators came together and discussed the necessity of a new police information and communication system to connect all police departments to each other, share information, and respond crime and the needs of citizens more effectively. One interviewee stated that "the next step after deciding of establishing POLNET was to go all the departments one by one, such as traffic, terror, criminal laboratories, and so on; work with officers to learn department's daily duties; and form software according to needs of the department." During these stages, officers used their tacit knowledge and extended it through socialization—creating new

knowledge through face-to-face contact, observation, and practice—with other officers. Some respondents also mentioned that socialization was a main knowledge conversion method in terms of teaching new users how to navigate POLNET.

Officers who were responsible for going other departments and forming software also used the externalization method—creating new knowledge through converting tacit knowledge into explicit knowledge—during the establishment of the software. As indicated before, explicit knowledge is codified knowledge; thus, writing the software program required officers codify their tacit knowledge, externalize it as explicit knowledge, and structure the software program.

Storing information into POLNET necessitates the combination method which is creating new knowledge through rearranging existing knowledge. For example, crime data that had been gathered through daily police work are stored into POLNET. Stored codified knowledge can be both stock and flow information. If different departments share information, it becomes flow information, such as crime/criminal records, wanted/stolen vehicle information, or wanted person records. On the other hand, if information includes any bylaw regulations about political parties, unions or police, or other necessary information, it is referred to as stocks.

Finding 6:

Outcomes of POLNET affected drivers of using POLNET.

Findings of the study showed that since the establishment of POLNET, it has been used efficiently and effectively for storing data, allowing access to information and sharing it, responding to criminal activities, facilitating to reach results of an incident, and serving the public.

All the respondents agreed on the effectiveness of POLNET and its positive outcomes. Organizational effectiveness brings the frequent use of POLNET.

The most comprehensive answer about the outcomes of POLNET mentioned the following: (1) The POLNET system provides the police better, faster, secure, effective and reliable services; (2) improves police practices, duties, and communication to be more practical, effective as well as traceable; (3) eliminates much of the expenses (labor and monetary) previously allocated for any inquiry purpose; (4) improves the quality of services that TNP provides to citizens; and enhanced organizational effectiveness and efficiency. Additionally, through POLNET, (5) coordination between units is gained rapidly; (6) the personnel have become more efficient and productive; (7) criminals are caught in a shorter time; (8) the custody period is now shorter; (9) concepts of time, place and limit in reaching information no longer exist; (10) the personnel are capable of using online voice and video communication with each other, share information and send e-mails to one other; (11) various announcements and broadcasts can be made on the POLNET main web page; (12) traffic controls are accelerated; documents like passports, car licenses, and driving licenses can be

obtained online throughout the country; and (13) it is possible to provide more qualified and rapid service to our citizens.

### 5.3 Answers to Research Questions

This section includes answers to research questions presented at the beginning of this research study. Responses are based on the findings derived from the analysis of interviews (face-to-face and telephone), survey data, and documentary evidence. Data analysis and findings have already been presented in Chapters 4 and 5. In fact, supportive research questions have already been answered through the findings, but these answers are briefly mentioned again in this section.

Minor Question:

Do the KM strategies of TNP match with the KM integrated model?

The KM integrated approach offered by Handzic and Zhou (2005) views KM as a combination of socio-technical enablers, knowledge processes, and knowledge stocks. KM outcomes in this model show the impacts of KM on the organization's performance.

In a general perspective, KM strategies for the POLNET system are compatible with the KM integrated approach: KM drivers affect the KM environment which includes organizational environment, information technologies, and KM processes. All of these components have an effect on organizational outcomes. On the other hand, several discrepancies emerge from

this type of organization. The police organization is different from other organizations that Handzic and Zhou (2005) study. Besides being a governmental institute, the police organization has distinctive occupational, culture, structure, goal, and job identity characteristics. Therefore, the subcategories of the KM components and their effects are different than any other organization's KM strategies.

According to the model, globalization, transformation (or virtualization), and digitalization cause the increased complexity, uncertainty and surprises that are ultimately the driving forces of KM for the organizations. Therefore, KM is necessary for organizations to keep up with changing global trends, shifting to the new knowledge-based economy, changing organizational forms, and the growing importance of knowledge work. The police organization is a nonprofit establishment. The aim of the police is to enforce the law effectively, including crime control, order maintenance, and service to the public. Like any other private organization, the police agency is also affected by shifting global trends. Parallel to those changes, the nature of crime, ways of committing crime, tools that criminals use to commit crimes, public order, and needs of the public also change. Therefore, the police have to be effective, efficient, and fast to keep up with those trends, to be one step ahead of criminals and to respond to public needs. Being aware of those changes and their responsibilities, the TNP has established the POLNET system to access and share information at anytime, from anywhere, and in a fast and secure way.



From the perspective of organizational characteristics, the police organizations have a unique environment. Like any other police organizations in the world, TNP has its own cultural themes such as solidarity and isolation. Additionally, hierarchical and centralized structures are dominant characteristics of TNP. In the environment, if knowledge is seen as a commodity and a competitive power, or a basis to be accepted by managers, knowledge sharing does not take place voluntarily. In the similar context, team-based, networked and systemic organizational structures support knowledge sharing while bureaucratic structures such as hierarchies, command and control, and authoritarian establishments discourage knowledge innovation and sharing.

Supportive Question 1:

Which drivers triggered the POLNET project?

All data from face-to-face and telephone interviews, self-administered questionnaires, and documentary evidence showed that necessity of a new system was the main driver behind establishing the POLNET system. The old system was not sufficient to meet new requirements that the police organization needed. It was expensive, not user friendly, and not adaptable. Therefore, fast and secure information sharing was impossible. Therefore, TNP needed a new network system that could adopt new technologies easily; provide voice, video, picture, and image sharing; allow fast and secure information sharing and storing; connect all police departments; and provide better service to the public.

Under the driver *necessity of new system*, information gathering, accessing, and sharing were three important components. The police are information dependent. Information comes both from the public and daily job-related processes. The police need to reach related information for crime solving. Therefore, accessing and sharing information processes must be fast and secure to achieve effective and efficient results. POLNET meets all these needs.

Not only was *necessity of providing and sharing information* a driver of POLNET, but also the need for connection between police units. The ability to inform all units at one time is an important and necessary characteristic of POLNET. Therefore, all important information for police applications can be reached systematically.

Moreover, quality and fast public service were other drivers. Through POLNET citizens can reach many kinds of information they need and process requests via the Internet. For example, citizens can apply for car license plates, driver's licenses, and passports, as well as inform the police of any criminal activities, without going to a police station.

Supportive Question 2:

Do organizational culture, structure, and leadership features affect the POLNET system?

In TNP, there is no doubt that organizational police culture, structure, and leadership features directly affect KM processes such as knowledge sharing, storing, and conversion. However, whether those effects support information

processes or not is debatable. Respondents answered related questions citing both “positive effects” and “negative effects.” For example, some respondents think that members of TNP always support each other and share knowledge because they think they are a family. This thought is a positive effect of the police isolation culture on information sharing. Similarly, officers who graduated from the Police Academy in the same year always support one another and share knowledge. This example shows the positive effect of police solidarity on information sharing.

On the contrary, some respondents asserted that people in TNP still think that “knowledge is power.” Therefore, this belief hinders members from sharing information.

The leadership skills of administrators also directly affect the POLNET system. Administrators have the authority and power to either sanction or refuse information sharing with other departments. If an administrator is open-minded and creative, has a mission and vision, and is knowledgeable about the technology, he/she will be more supportive of information sharing.

Rank is another important factor in information processing. There is no certain answer among which ranked officers information sharing is more prevalent. Again, there are controversial responses. Some respondents said middle-level administrators are more knowledgeable about technology and are more supportive of information sharing, while others felt low-ranked officers are more supportive.

Supportive Question 3:

What is the technological infrastructure of the POLNET system?

POLNET, as a tool, is composed of information technologies. The roles of POLNET are allowing information and knowledge transfer among all units of the police organization, connecting all divisions together, and providing effective and efficient service to the public. To perform all of these duties, a high technological infrastructure is needed.

As indicated in Finding 4, POLNET uses databases, text-bases, data warehouse and knowledge maps for knowledge storage; search engines for knowledge retrieval; e-mail system, electronic bulletin boards, whiteboards, video conferencing, and groupware for knowledge transfer; data mining, statistical tools, and graphical representation for knowledge creation; and intranets, extranets, and portals for general communication.

Supportive Question 4:

What are the KM processes of POLNET?

Data analyzing revealed three categories under the KM processes of POLNET: knowledge conversion, information storage/retrieval, and information sharing/transfer. Socialization, externalization, and combination are three knowledge conversion processes. Socialization first occurred during determining which departments needed what information to establish a software system. During this state, information conversion took place between the establishers of

POLNET and officers in departments. The establishers discovered which departments needed what information through socialization, the idea that new knowledge is gained through face-to-face contact, observation, and practice. Socialization also occurs between experienced officers and naïve persons; new officers learn how to use POLNET from experienced personnel.

The establishers, who had new tacit knowledge through socialization, converted it to codified explicit knowledge by structuring the software program. This method is called externalization which, through new knowledge, is expanded by converting tacit knowledge into explicit knowledge. The combination method, creating new knowledge through rearranging existing knowledge, occurs when storing information. As indicated before, new information comes from incidents, records, and public information. All data come together in information databases. Using this codified information for routine daily police work and interpreting and making additions to other information require the combination method.

Other categories under the KM processes of the POLNET are information storage/retrieval and information sharing/transfer. Some of information storage databases are:

- AFIS (Automated Fingerprint Information System),
- KPL (Criminal Police Laboratories Information System),
- PBS (Personnel Information System),
- EmisNet (Police Intelligent Service Information System),

- TBS (Traffic Information System),
- PEBS (Police Electronic Information System) which includes stolen vehicles, fingerprints, vehicle owners, criminal names, wanted/missing persons, disqualified drivers, firearms records, public security, etc.

For information transferring, users employ one of the information technologies that POLNET provides. Supportive Question 3 gives the names of these technologies.

Supportive Question 5:

Do outcomes of the POLNET system affect drivers?

POLNET increases secure and fast information sharing among departments. Both personnel and their jobs have become more efficient and productive. It uses many kinds of information technology software, such as e-mail system, electronic bulletin boards, whiteboards, and video conferencing, to increase communication. Therefore, coordination between units is provided. Through POLNET's web page, all the units become aware of announcements at the same time. From the perspective of police work, including persuading criminals, POLNET provides many benefits. For example, criminals are caught in a shorter time and the custody period is shorter, allowing the police to get necessary information about the suspect rapidly. POLNET also provides quality service to public. People do not come to station and wait in line to get a passport, car license, or driver's license. In short, POLNET has increased the efficiency

and effectiveness of the police organization in both policing-related jobs and in serving public.

#### 5.4 Conceptual KM Model for the POLNET System

The conceptual framework that leads this study was presented in Chapter II. The “driver-enabler-process-knowledge-outcome framework of KM” model is offered by Handzic and Zhou (2005) to show general KM approaches of business organizations. This integrated framework brings all different approaches of KM together by offering three components: KM drivers, KM initiatives/solution, and KM outcomes. The second component, KM initiatives/solution, covers three sections: socio-technical enablers, knowledge processes, and knowledge stocks.

This model considers complexity, uncertainty, and surprises as the ultimate driving forces behind KM for organizations. Socio-technical enablers include both organizational environment and technological infrastructure including a wide range of information and communication technologies. Organizational culture, leadership, and organizational structure are three aspects of organizational environment which directly influence KM processes. Information and communication technologies have an undeniable role during KM stages. Various kinds of information technologies such as knowledge repositories, knowledge maps, search engines, and e-mail systems, facilitate KM.

Knowledge processes includes knowledge creation, knowledge storage, knowledge sharing, and knowledge application strategies. Another section of KM initiatives is knowledge stocks. The integrated model considers all types of

knowledge, such as human capital (tacit knowledge), organizational capital (codified knowledge), and customer (external) capital, as organizational knowledge assets. To survive and enable success in the new economy, organizations need to manage their knowledge stocks.

Finally, the last component of the integrated model is KM outcomes that show the impacts of KM on organizational performance. Major outcomes of knowledge management are knowledge retention, productivity improvement, and innovation (Handzic & Zhou, 2005). Additionally, other possible outcomes of KM include “competitiveness, agility, reputation, and innovation” (Holsapple & Singh, 2003, p. 216), increases in revenue and profit (Earl, 2001), and “customer intimacy, product leadership, and operational excellence” (O’Dell, Elliott, & Hubert, 2003, p. 280). The following figure 5.1 presents the integrated framework with details.



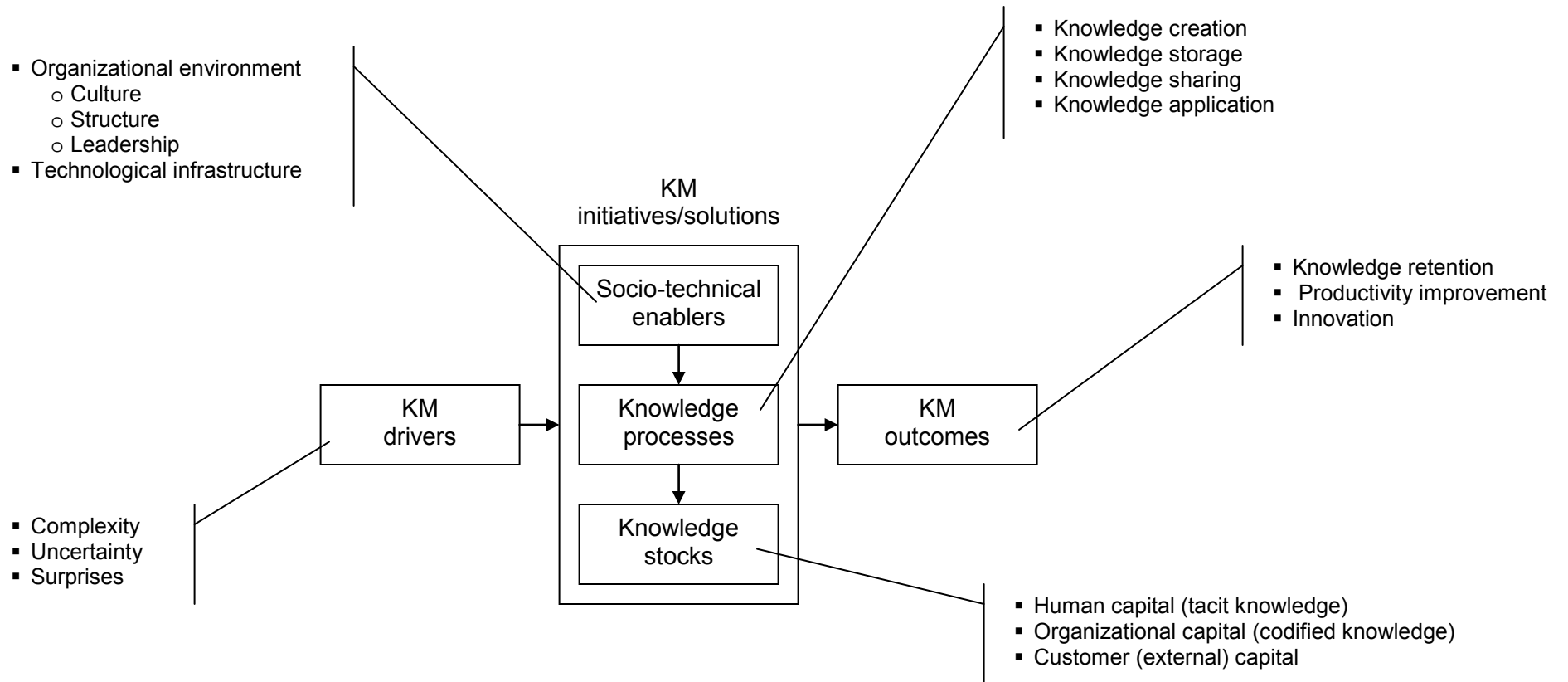


Figure 5.1. Driver-enabler-process-knowledge-outcome framework of KM (detailed) (Handzic and Zhou, 2005).

The police organization is different than any other business organization in several respects. First, the police organization is a governmental organization. Second, its job title is different than any other occupation, and third, the police organization has a unique organizational culture and structure which is even different from other governmental organizations. Even though the conceptual framework model has been designed for business organizations, it also fits governmental organizations in the general sense.

Depending on the conceptual frame of the integrated framework model and data results, this study offers a revised KM model to the POLNET project. The revised model covers the most influential drivers behind establishing POLNET; organizational culture, structure, and leadership characteristics of administrators that affect the establishment of the POLNET system; technological infrastructure including information and communication technologies as the main component of the POLNET system; knowledge creation, knowledge storage, and knowledge sharing as knowledge processes; and outcomes of POLNET that affect the drivers behind establishing and using POLNET.

Analysis of face-to-face and telephone interviews, self-administered questionnaires, and documentary evidences showed that *necessities for new system* is the main driver in establishing the POLNET system. These necessities are information access, information sharing, connection of police units, and quality service to the public. Both information access and information sharing are required to be fast and secure.

Data also supported that *organizational environment* has a significant influence on the establishment of the POLNET system. Organizational culture, structure, leadership features, and rank system are considered part of the organizational environment. Like the KM processes section of the main integrated KM model, data revealed that the POLNET system has adopted the same KM processes. Knowledge stocks, as the last section of KM initiative/solution of the actual conceptual framework, does not fit into the revised KM model of the POLNET system. This section has focused on economical outcomes of KM. However, the POLNET system has not established any economic benefits or outcomes. Therefore, this section has not been settled in the revised model.

According to analysis of data, KM outcomes include effective and efficient service; fast, quality public services such as traffic control, and passport, car license, and driver's license processes; productive personnel; coordination and communication between TNP units and members; adoption of IT processes that result in expedited service such as catching criminals, less custody period, etc. The following figure 5.2 is the revised KM model for the POLNET system with subcategories of each component.

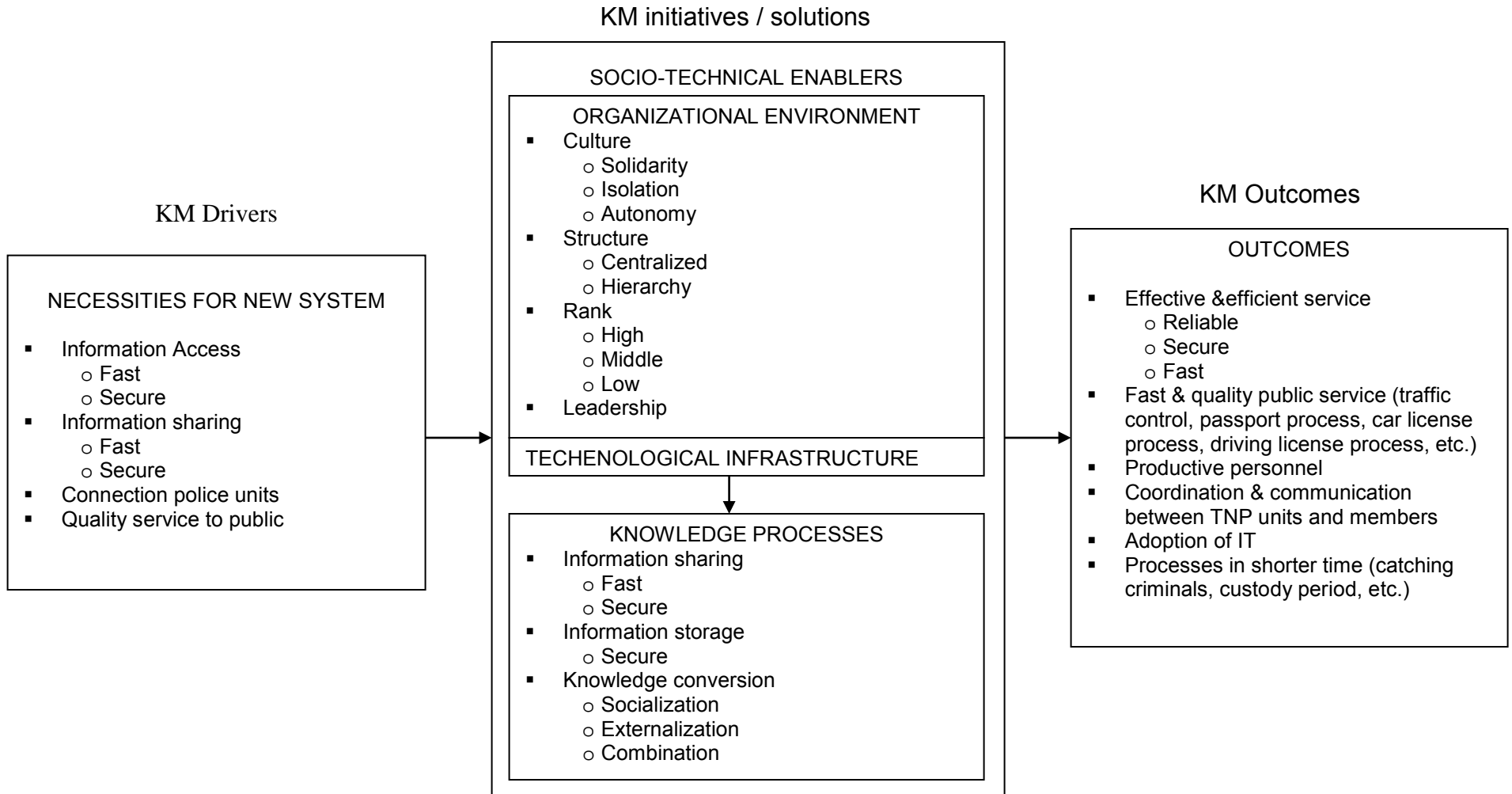


Figure 5.2. Revised KM model for the POLNET system.

Data analysis showed that the drivers of KM were the main reasons why the POLNET system was established. During establishment, organizational environment definitely influenced initial drivers, and these initial drivers resulted in a technological infrastructure (POLNET as a tool). After the establishment of the POLNET infrastructure, this tool produced processes with the organizational environment. As a result, the KM initiatives/solution component produced outcomes.

Once the POLNET tool was established, initial drivers were not active except insofar as the monitoring system to be sure initial drivers (goals) were being achieved. After achieving initial drivers (goals), there have been necessities for faster and more accurate initial drivers, as well as new drivers requested by departments. Departments decide the necessity of new drivers according to outcomes. Therefore, outcomes determine new drivers, and the Department of Information Technologies is responsible for establishing new components for the POLNET tool. At this time, not only does the organizational environment influence new drivers, but the technological infrastructure also affects driver components of the model. Again, organizational environment and information technologies affect processes; and the KM initiatives/solution component affects outcomes. This system is cyclical.

Additionally, drivers also affect organizational environment, information technologies, and KM processes. For example, administrators may be more supportive of information sharing after getting positive results from the system.

Similarly, knowledge processes may occur more easily between differently-ranked officers. More successful outcomes result in establishing and using new technological systems to produce more benefits. Figure 5.3 illustrates these processes.

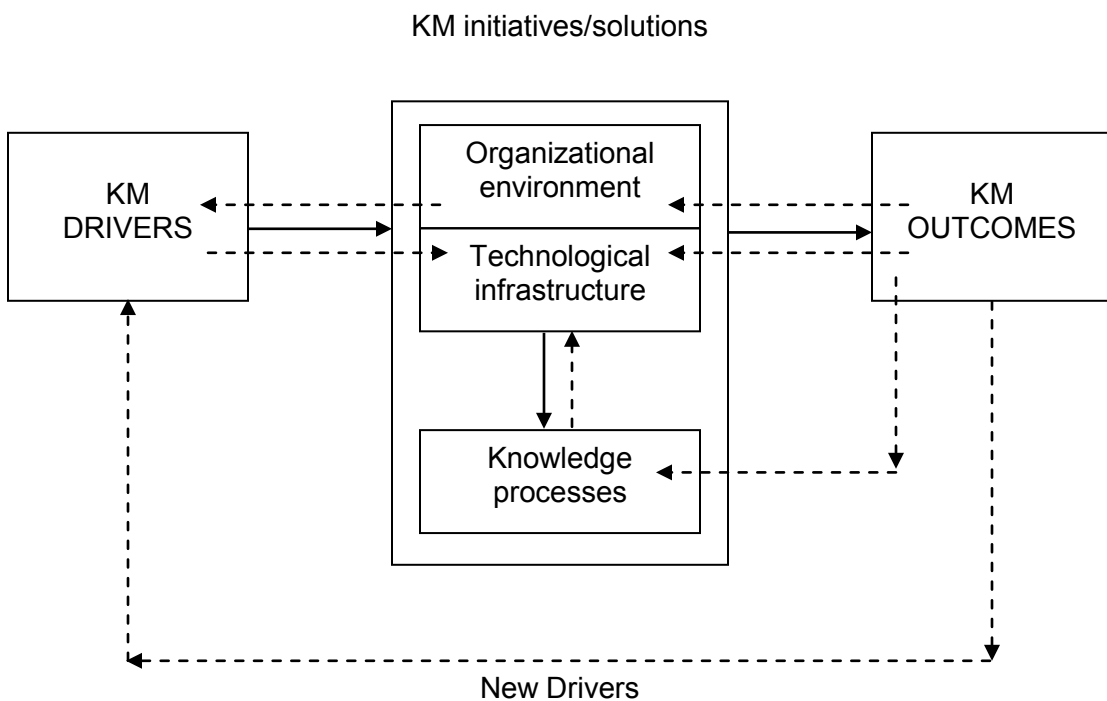


Figure 5.3. Conceptual knowledge management model for the POLNET system.

### 5.5 Implications

This study has several implications for the police organization, police administrators, the scholarly community, and policy makers who are interested in information, knowledge, and KM issues in policing.

### 5.5.1 Organizational and Managerial Implications

This dissertation indicates a number of implications for the organization and its administrators. First, despite the differences in organizational environment, police administrators need to realize the knowledge assets residing in the minds of any ranked or unranked officers. Administrators first must understand the importance of knowledge sharing and then, motivate and encourage other officers working with him/her to share their knowledge for the benefit of the organization.

Second, the use of information management technologies should be extended throughout the organization because the technological infrastructure, along with organizational environment, influences knowledge processes as well as outcomes.

The third implication is that administrators should be aware of cultural and structural features of the organization and their impact on knowledge sharing and organizational outcome, while learning to discard any negative effects of those factors on knowledge sharing. Without having such considerations, KM may not produce the desired outcomes for the organization. Some organizational factors may negatively influence knowledge sharing within the organization which, in consequence, may negatively affect the safety and security service to the public.

Managers of the TNP, fourth, need to be aware of informal knowledge sharing among same-ranked officers. The study shows that there is an unnamed resistance within the organization toward sharing data across different ranks.

Police administrators should consider the importance of such informal organizational structures to more effectively share knowledge within the agency.

Finally, POLNET should not be considered only an information tool.

POLNET is the new face of TNP and the biggest aid in serving the public and bringing all criminal activities to light. In keeping current, administrators should also consider how POLNET is important for TNP and facilitate all procedures for knowledge sharing.

#### 5.5.2 Policy Implications

There are a number of policy implications in this study. First, any policy about developing information management systems in law enforcement agencies should give attention to the needs of the agency and the speed of the system because if the system is fast, secure, and meets the information needs of the organization, it can easily be used and accepted by members of the organization with little resistance. Respondents' argument about the impact of POLNET on faster and higher quality public service makes the importance of speed and a user-friendly system visible for public organizations.

Second, policy makers should take into consideration that the more expensive system is not always the better one. Even though the old TNP information management system was expensive, it has a number of deficiencies compared to POLNET. For example, the data could not be updated regularly which made the system outdated. Similarly, deriving data from the old system



was time consuming which made policing inefficient with respect to time spent and labor used.

Policy makers, third, should consider organizational culture and leadership characteristics of police administrators since these variables largely influence the establishment of information systems and data sharing across branches of the organization. The structure of the organization, similarly, should be taken into account while establishing such systems because the structure drastically affects the collection and sharing of data in the organization. Especially highly centralized and hierarchical organizations, like TNP, should be given more attention since organizations with centralized structure and hierarchic composition negatively affect information management system success. The informal information sharing structures positively affect liked-ranked officers while differently-ranked officers do not tend to share information.

Lastly, it should be noted that this study provides support for POLNET policymakers because it argues that POLNET provides different kinds of data that can be used to articulate various kinds of knowledge for a variety of end users within the organization. It has several databases for different branches within the organization. It has been a convenient and efficient way to collect and share data to different segments of the TNP. In addition, it can be also said that POLNET is a dynamic system because its outcomes affect its drivers. Indeed, all components to some extent affect one another. Therefore, this study provides support for establishers and policymakers of POLNET.

## 5.6 Contributions of the Study

This study makes significant contribution to the current scholarly literature as well as provides significant implications for policymakers and law enforcement administrators. The first contribution of this dissertation is that the strict definitions of data, information, and knowledge are given based on a wide range of literature review. These concepts have been analyzed in detail and makes differences apparent for the reader and the scholarly community. Although these three definitions are very close and used in place of each other, their functions and usage are different in terms of KM implementations. This research covers all three of these definitions into one work. KM applications in TNP include handling data, information, and knowledge of individuals at different levels of management.

Secondly, this study employs the integrated framework model of KM that brings together different approaches of KM applications. This model offers that KM does not only consist of information and communication management technologies. Moreover, the organizational factors of culture, structure, hierarchy, and leadership features have critical impact on KM as a whole. The study, accordingly, provides a rich discussion of the integrated framework model of KM by taking different factors affecting the framework into consideration.

The third major contribution of the this research is the integration of the different concepts of drivers, organizational environment, information and communication technologies, knowledge sharing, different forms of knowledge

conversion, and outcomes of KM applications in the TNP into one study. This study demonstrates the impacts of organizational environment on knowledge sharing practices through POLNET. That is to say, researchers and managers should take organizational environment into account because it has huge impacts on knowledge sharing within an organization.

This study, fourth, shows that informal organizational structures may emerge among same-ranked officers. Accordingly, it is a contribution to the literature that different layers within an organization may have their own informal knowledge sharing systems. Similarly, this study shows the reluctance of officers to share knowledge across different ranks and layers, which indicates another significant contribution to the literature.

Fifth and, perhaps, the most important contribution of this study is that it focuses on a semi-military organization: Turkish law enforcement. Studies about KM systems in policing mostly concentrate on countries which have federal structure. In such countries, every state has its own KM system. The US, for example, consists of states, and studies focus on states' KM structures. However, a comprehensive review of this study has not found any study that analyzes KM systems of a centralized country's law enforcement. This study hence concentrates on TNP and its KM structure, POLNET, which provides a number of insightful contributions to the literature about a centralized, highly hierarchic, semi-military public organization with an overwhelming number of personnel. In general, the police organizational environment provides a rich

arena for the study of KM, especially the knowledge sharing process. As with any other police organizations, TNP also has unique organizational culture, structure, and leadership features. This study revealed that each of these factors surrounds the knowledge sharing process.

Literature about KM generally focuses on business organizations. Private organizations have different kinds of drivers for KM and organizational environment than police organizations have. They also take into consideration outcomes that provide economic benefits. The police organization, on the other hand, is a semi-military organization. This research shows that drivers for KM, organizational environment, and knowledge processes of semi-military organizations are different than business organizations. For example, no other private or government organization has the strict hierarchical structure of policing. Therefore, it can be argued that the KM system of public organizations in general, and semi-military organizations in particular, have some differences from the corporate sector especially in terms of drivers behind KM, organizational environment, and knowledge processes. This study notably contributes to the literature by making this argument visible and tested.

#### 5.7 Recommendations for Future Research

This research study discussed KM strategies of TNP during the establishment of POLNET. The research covered KM drivers, as well as the effects of organizational environment and information technologies on knowledge processes and outcomes. The main area of focus showed how organizational

culture, structure, and other organizational features affected knowledge sharing strategies. To truly be able to understand the big picture of KM, this study tried to cover as many as components of the KM approach. Even though many implications came from this work, all parts of KM should be handled separately by future researches to expose all details and interactions between the various parts.

Knowledge sharing is an important component of KM. This requires further examination. Future research should focus on, especially, the roles of organizational environment on knowledge sharing because successful outcomes directly depend on knowledge processes. Another component of KM is information and communication technologies. The importance of IT for knowledge sharing is undeniable. Which technology is mainly used by police may be another research study in the future.

This study employed a qualitative case study approach, adopting exploratory and descriptive methods to reveal relationships between all components of KM. Statistically; measurements are required to expose the degree of relationships. Numbers display how strongly or weakly interactions occur between the organizational environment and technological infrastructure; between socio-technical enablers and process; and between KM initiatives and KM outcomes.

## 5.8 Conclusion

In the global world and this information age, it is accepted that knowledge is power. From the perspective of organizations, however, having knowledge is not sufficient enough by itself to stand alone in the competitive arena. To be aware of what knowledge the organization has, how to utilize it, and how to share knowledge to make necessary decisions and achieve success is the fundamental duty of organizations. Accomplishment of these goals requires effective and efficient KM applications in the organization.

Besides business organizations, KM strategies are also important factors for governmental organizations. Semi-military organizations of law enforcement, namely police, have to give special attention to KM, particularly knowledge sharing. The police organization is firstly responsible for the security of the public. Parallel to the changing world, traditional crime methods are also changing; criminals invent incredible ways of committing crimes. Additionally, increasing information technologies facilitate criminals and eases escape from the police. However, the police have to be more powerful to prevent crime or solve any criminal incident. The success of police depends on having organizational assets and managing them. The tragedy of 9/11 showed the importance knowledge sharing between units as a part of KM.

Throughout this dissertation, I have mentioned how knowledge is important for organizations, in this case the police organization, and how it can be managed to produce value for the organization. The aim of this study was to

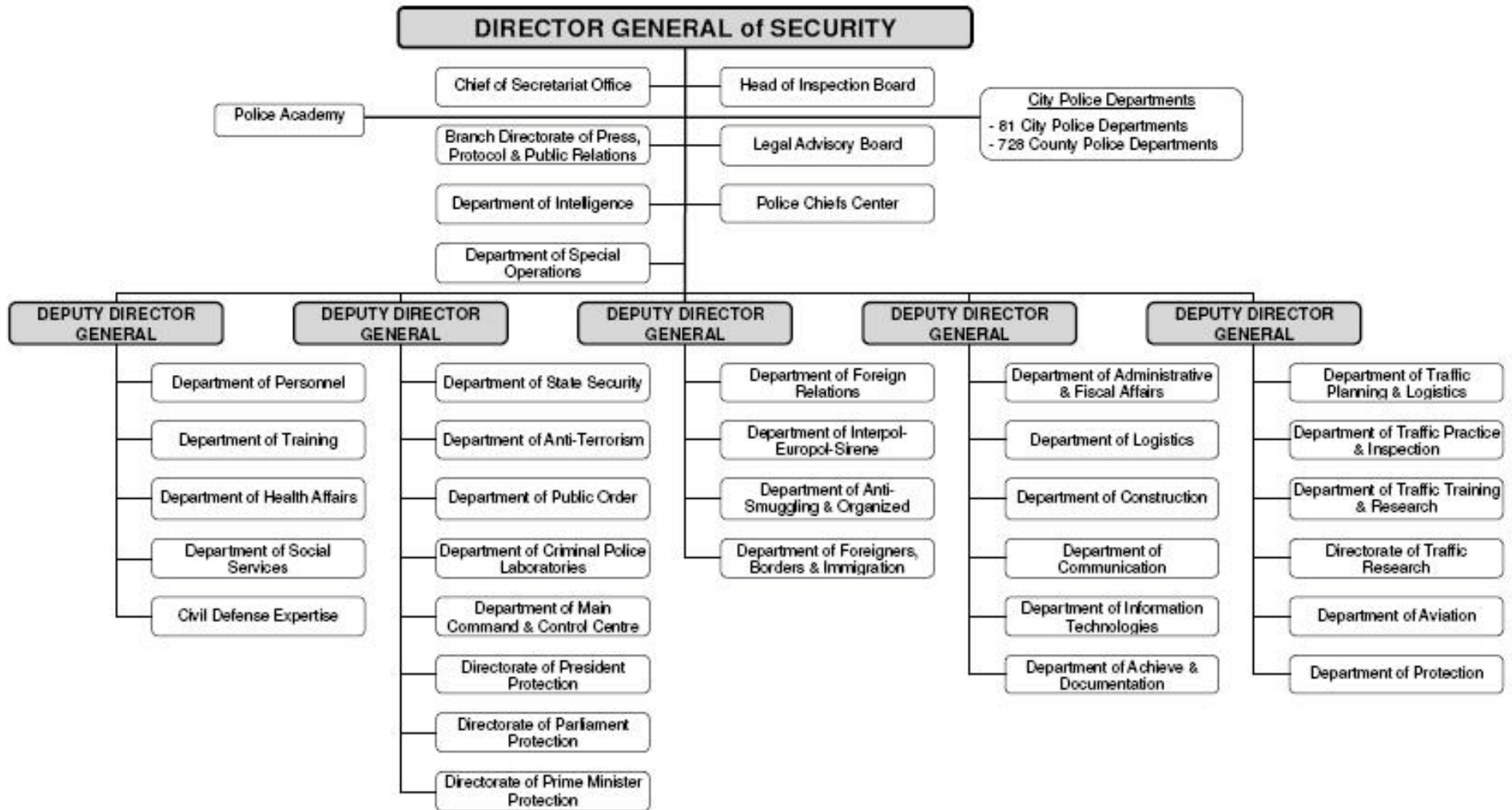
understand how TNP has applied KM strategies through POLNET. With this study, I tried to expose drivers behind POLNET; the effects of organizational environment and information technologies onto the knowledge processes, especially on knowledge sharing; and influences of knowledge processes on outcomes. As a result, organizational culture and structure have both positive and negative effects on knowledge processes. Adopting positive effects and removing negative ones will increase organizational efficiency and effectiveness.

APPENDIX A

ORGANIZATIONAL CHART OF TURKISH NATIONAL POLICE

(Adopted from <http://www.egm.gov.tr>)





APPENDIX B

INSTITUTIONAL REVIEW BOARD FOR THE PROTECTION OF HUMAN

SUBJECTS IN RESEARCH (IRB)

June 17, 2008

Kubra Gultekin  
School of Library and Information Science  
University of North Texas

Re: Human Subjects Application No. 08-191

Dear Kubra Gultekin:

As permitted by federal law and regulations governing the use of human subjects in research projects (45 CFR 46), the UNT Institutional Review Board has reviewed your proposed project titled "Knowledge Management and Law Enforcement: Examination of Knowledge Management Strategies of Police Information System in the Turkish National Police." The risks inherent in this research are minimal, and the potential benefits to the subject outweigh those risks. The submitted protocol is hereby approved for the use of human subjects in this study. **Federal Policy 45 CFR 46.109(e) stipulates that IRB approval is for one year only, June 17, 2008 to June 16, 2009.**

Enclosed is the consent document with stamped IRB approval. Please copy and **use this form only** for your study subjects.

It is your responsibility according to U.S. Department of Health and Human Services regulations to submit annual and terminal progress reports to the IRB for this project. Please mark your calendar accordingly. The IRB must also review this project prior to any modifications.

Please contact Shelia Bourns, Research Compliance Administrator, or Boyd Herndon, Director of Research Compliance, at extension 3940, if you wish to make changes or need additional information.

Sincerely,



Kenneth W. Sewell, Ph.D.  
Chair  
Institutional Review Board

KS:sb

CC: Dr. Brian O'Connor

APPENDIX C

TURKISH NATIONAL POLICE STUDY APPROVAL

İÇİŞLERİ BAKANLIĞI  
Emniyet Genel Müdürlüğü



Sayı : B.05.1.EGM.0.72.02.03/857

.../04/2007

Konu : Akademik Çalışma

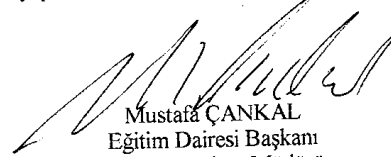
GENEL MÜDÜRLÜK MAKAMINA

Yetiştirilmek Amacıyla Yurtdışına Gönderilecek Devlet Memurları Hakkındaki Yönetmelik hükümleri çerçevesinde yurtdışındaki üniversitelere master ve doktora yapmak üzere gönderilen personelin tez çalışması aşamasında Genel Müdürlüğümüzün çeşitli birimlerinden veri toplamak, teşkilatın belirli birimleri ve personeli ile anket ve görüşme talebinde bulunmakta, Emniyet Genel Müdürlüğü Eğitim Dairesi Başkanlığı Kuruluş, Görev ve Çalışma Yönetmeliğinin 24/g maddesi "Teşkilat personeli veya akademik çalışmalarda bulunanların anket uygulama çalışmaları ile ilgili işlemleri yürütmek" hükmü gereğince akademik çalışma yapmak üzere başvuran personelin talepleri değerlendirilmektedir.

Yurtdışında master ve doktora yapmakta olan teşkilat personelinin tez çalışmasında kullanmak üzere talep ettikleri verileri, suç istatistiklerini alma, anket ve görüşme gibi araştırma metotlarını uygulama konularında Genel Müdürlük Makamından genel bir onay alınması ve bu onayın tüm teşkilatımıza duyurulması TIPS ABD Genel Koordinatörü 4.Sınıf Emniyet Müdürü Samih TEMUR tarafından verilmiş olan dilekçe ile talep edilmektedir.


Yetiştirilmek Amacıyla Yurtdışına Gönderilecek Devlet Memurları Hakkındaki Yönetmelik hükümleri çerçevesinde yurtdışındaki üniversitelere master ve doktora yapmak üzere gönderilen personel Devlet Personel Başkanlığınca verilen kontenjanlar oranında gönderilmekte ve tez konuları Genel Müdürlükçe belirlenmektedir.

Bu nedenle, Yetiştirilmek Amacıyla Yurtdışına Gönderilecek Devlet Memurları Hakkındaki Yönetmelik hükümleri çerçevesinde yurtdışı master ve doktora eğitimine gönderilen personele Genel Müdürlümüze bağlı birimlerde ve taşra teşkilatında akademik çalışma yapma talebinde bulunması halinde tez çalışması yapılabilmesi hususunu onaylarınıza arz ederim

  
Mustafa ÇANKAL  
Eğitim Dairesi Başkanı  
1.Sınıf Emniyet Müdürü

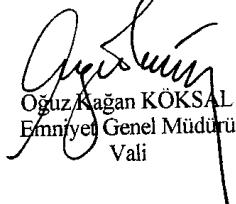
Uygun Görüşle Arz Ederim.

07/04/2007

  
Dr. Necati ALTINTAŞ  
Emniyet Genel Müdür Yardımcısı  
1.Sınıf Emniyet Müdürü

O L U R

07/04/2007

  
Oğuz Kağan KOKSAL  
Emniyet Genel Müdürü  
Vali

APPENDIX D

TURKISH NATIONAL POLICE STUDY APPROVAL (ENGLISH)

Turkish Republic (T.C.)  
INTERIOR MINISTRY  
Turkish National Police (TNP)

Reference: B.05.1.EGM.0.72.02.03/857  
Topic: Academic Research

TO TNP GENERAL DIRECTORATE

In the scope of "Regulations of Civil Servant Who Is Sent to Abroad", requests of TNP personnel, who have been sent abroad for pursuing their master and doctorate degrees, to use their academic research including collecting data and surveying in every departments of the TNP have being evaluated according to 24/g article, that is to execute procedures relating about personnel's demands of surveying, of Turkish National Police Education Department Establishing, Duty and Working Regulations.

Request letter which is about both giving a general approval by TNP General Directorate about having crime records, surveying, and interviewing which are related about research methods, and announcing that approval to TNP personnel who have been sent abroad for having their master and doctorate degrees is demanding by Samih Temur, fourth-class-chief superintendent and director of Turkish Institute Police Studies (TIPS).

In the scope of "Regulations of Civil Servant Who Is Sent to Abroad", those who go abroad to pursue master or doctorate degrees are sent by T.C. State Personnel Department, and research subjects are determined by TNP General Directorate.

For this reason, in the scope of "Regulations of Civil Servant Who Is Sent to Abroad", I present this approval which is about academic researching in any department of TNP.

Presenting with agreeable  
decision.  
04/07/2007

SIGNATURE  
Dr. Necati Altintas  
Deputy of TNP General  
Directorate

OK (Approval)  
04/07/2007

SIGNATURE  
Oguz Kaan Koksal  
TNP General Directorate  
Governor

SIGNATURE  
Mustafa Cankal  
The Head of Education  
Department  
1<sup>st</sup> Degree Police Chief

APPENDIX E

INTERVIEW PROTOCOL AND SURVEY QUESTIONNAIRE



Dear participant,

My name is Kubra Gultekin. I am a police captain in the Turkish National Police and a PhD student in School of Library and Information Science at the University of North Texas. My aim, in this study, is to analyze knowledge management in the Turkish law enforcement. The following questions have been designed to learn more about knowledge management (KM) strategies of the Turkish National Police through POLNET. Each question is related about one phase of KM strategies so your answers are very important to understand KM processes completely. It may take about one hour to complete the survey.

Your completion of this survey is completely voluntary. You have the right to skip any question you choose not to answer. There are no foreseeable risks involved in this study. Your name will not be requested so the study will be anonymous. All records will be kept confidential by the principal investigator.

If you have any questions about the study, please do not hesitate to contact me by e-mailing. You may also contact my dissertation advisor, Brian O'Connor, PhD, UNT-School of Library and Information Science.

This research project has been reviewed and approved by the UNT Institutional Review Board. Please contact the UNT IRB at 940-565 3940 with any questions regarding your rights as a research subject.

If you agree to participate, you may keep this document for your records.

## SURVEY QUESTIONS

### *Questions about Professional Background:*

How long have you been working for the TNP?

What is your job title?

When did you start the post?

What are the primary functions and responsibilities of your position?

### *Questions about Research Study*

#### *[Introduction]*

- Could you describe what POLNET and its aims are?
- Is POLNET important for TNP organization? Why?

#### *[Drivers]*

- How did the idea of POLNET emerge? And, what were the main reasons for establishing POLNET?

#### *[Enablers]*

Organizational environment

- *Organizational culture* (unwritten rules among members of the organization/ shared values and believes/ common assumptions)
  - Do you think the culture of TNP supports information sharing and innovation?

- If so, how does the culture of TNP supports support information sharing and innovation, and which characteristics of the culture are they?
- If no, why? What are the obstacles for information sharing and transferring?
- *Leadership*
  - How do you describe attitudes of top level police administrators for establishing of POLNET?
  - Do you think that management skills of department's chiefs affect information sharing through POLNET? How?
  - What kinds of characteristics should leaders have to support information management through POLNET?
- *Organizational structure* (organizational chart, hierarchy, centralized structure, division of labor, etc.)
  - Does organizational structure of TNP affect to information sharing through POLNET? How?
  - Do you think organizational structure of TNP encourages or discourages participation and collaboration among members of TNP?
  - Are there any differences among different ranks (from police officer to high level administrator) in terms of involvement information processes through POLNET?

## Technological infrastructure

- Before POLNET, what kinds of information management strategies did TNP adopt? What were the disadvantages or advantages of these techniques?
- Some information management processes are mentioned below. Are there any kinds of information creation, storage, retrieval and transfer technologies (among examples) used through POLNET? If so, what are they?

IM process	Examples
Knowledge storage	Knowledge repositories, databases, text-bases, data warehouse, data marts
Knowledge storage	Knowledge maps, knowledge directories, yellow pages
Knowledge retrieval	Search engines, intelligent agents
Knowledge transfer	E-mail systems, electronic bulletin boards, whiteboards, electronic forums, videoconferencing, voice mail, groupware
Knowledge creation	Data mining, statistical tools, graphical representation, simulation technologies
Knowledge application	KM systems, workflow systems, expert systems, rule induction, decision trees
All	Internet, intranets, extranets, portals

### [Processes]

- Among bellows, what kind(s) of knowledge conversion method(s) is/are generally used through the POLNET? Why?
  - Socialization: Creating new knowledge through face-to-face contact, observation, and practice.
  - Combination: Creating new knowledge through rearranging existing knowledge.
  - Externalization: Creating new knowledge through converting tacit knowledge into explicit knowledge.
  - Internalization: Creating new knowledge through mixing explicit knowledge with existing tacit knowledge.
- What kinds of information are shared through the POLNET system?
- How is information transferred through POLNET system?
- Are members of TNP willing to share information?
- Does the system work properly? If you see any problem, how can it be improved?

### [Stocks]

- Are there any rule and directive about how POLNET is used?
- Does POLNET increase problem solving and decision making processes in the organization? Why? How?
- How do information managers decide what kinds of knowledge should be put into POLNET system? Are there any criteria for this?

[Outcomes]

- What results does POLNET produce?
- Does the result of POLNET usage affect service delivery (system or programs of POLNET)? If so how? If not why? [In another word; how do outputs of using POLNET affect inputs?]

APPENDIX F

CODEBOOK

## 1. Drivers of knowledge management

- *Necessity of new system*: refers to new information system because of insufficiency of the old one.
- *Necessity of accessing to information*: refers to needs of officers to reach all required information.
  - *Criminal investigation*: refers to necessary of gathering and sharing information for crime and criminal investigations.
- *Characteristic of information sharing*: refers to demand of fast and secure information sharing.
  - *Fast information sharing*
  - *Secure information sharing*
- *Necessity of connection between police units*: refers to network system among all police stations all over Turkey

## 2. Enablers of organizational environment

- *Organizational culture*
  - Solidarity
  - Isolation
  - No connection
  - Unwilling to share
- *Organizational structure*
  - Centralized structure
  - Hierarchical structure



- high level
  - low level
- *Leadership*
  - Characteristics
  - Affect management skill
  - Attitudes of top level police administrators
    - supportive
    - non supportive
- 3. Enablers of technological infrastructure
  - Information management technologies
- 4. Knowledge management processes
  - *Knowledge conversion*: refers to constitute new knowledge by developing replacing the collective knowledge.
    - a. *Socialization*: refers to creating new knowledge through face-to-face contact, observation, and practice.
    - b. *Combination*: refers to creating new knowledge through rearranging existing knowledge.
    - c. *Externalization*: refers to creating new knowledge through converting tacit knowledge into explicit knowledge.
  - *Information storage/retrieval*: refers to storing, organizing, and retrieving information in different forms, such as written documentation, codified information, or procedures.

- *Information sharing/transfer*: refers to distributing the right information to right officers in quick and secure way.

5. Outcomes of knowledge management

- *Result of POLNET*: refers to produces of POLNET.
- *Effects of results to service delivery*: refers to affects of outputs of POLNET on to inputs.

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