Investigating KM antecedents: KM in the criminal justice system

M. Nordin, David J. Pauleen and G.E. Gorman

Abstract

Purpose – The specific aim of this paper is to explore the multi-disciplinary academic antecedents of KM in order to better understand KM. By doing so, it is suggested that KM can be more effectively applied in real-world situations, such as professional occupations.

Design/methodology/approach – The approach is conceptual: five core antecedents of KM – philosophy, sociology, psychology, computing and information systems, and management – are explored and associated with the criminal investigation process.

Findings – KM antecedents can be applied to the professional discipline of criminal investigation to create a conceptual model of knowledge management for the criminal investigative process. The model offers guidance on ways in which KM can be understood in terms of the criminal investigative process.

Research limitations/implications – KM has been considered a somewhat nebulous subject, so there is value in exploring its multidisciplinary roots to gain a better understanding of it and how it can be more effectively applied in specific organizational or practitioner contexts.

Practical implications – By mapping the KM antecedents to the criminal investigation process a conceptual model has been developed, which it is believed could prove useful in helping police organizations, as well as academics studying the criminal justice system, to better understand the discipline of KM in the context of law enforcement-related work.

Originality/value – While KM antecedents have been identified, the paper is one of the first to explicitly show how they can be used to link KM to real world situations – in this case the criminal investigative process.

Keywords Criminal justice, Policing, Knowledge management, Administration of justice and law enforcement

Paper type Conceptual paper

Introduction

On the surface the disciplines of knowledge management (KM) and criminal justice seem to be distinct; however, deep within the foundations of both disciplines are apparent and significant links. The aim of this paper is to explore these links. We do so by first investigating the multi-disciplinary academic antecedents of KM. We then map them onto one particular sub-system of the criminal justice system (CJS) – policing – specifically one of policing’s key activities, the criminal investigation process (CIP). By antecedents we mean those disciplines that arguably inform and support much of what is considered to be KM. We suggest that because KM is often considered a somewhat nebulous subject, that there is value in exploring its multidisciplinary roots in order to gain a better understanding of it and possibly more effective ways to apply it in organizational and practitioner contexts.

Very little research has been conducted based on the antecedents of KM, though many of the antecedents have been identified (Table I – see Determining the KM Antecedents (p. 7)). No instances of studies have been found that explicitly explore the relationship between KM antecedents and CJS activities such as the CIP, though there have been several previous
KM related CIP studies (see Greenwood et al., 1977; Innes, 2003; Luen and Al-Hawamdeh, 2001; Morgan, 1990; Simms and Petersen, 1991; Swanson et al., 2003). These studies were mostly related to the objectives of police work and the issues related to police organizations.

The paper poses two questions:

1. Which KM antecedents are relevant to the criminal investigative process?

2. What is the nature of the relationship between these KM antecedents and the criminal investigation process?

Essentially we develop a conceptual model that links all the constructs related to both the KM antecedents and the criminal investigation process. This conceptual model will be useful for any police practitioners, such as criminal investigators, who need to understand the link between KM and the CJS, particularly, the CIP.

### Table I

<table>
<thead>
<tr>
<th>Source</th>
<th>Multi-disciplinary antecedents of KM</th>
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<tbody>
<tr>
<td>Prusak (2001)</td>
<td>Intellectual antecedents: economics, sociology, organizational learning, philosophy and psychology. Practices bringing significant content and energy to knowledge management are information management, the quality movement, and the human factors/human capital movement</td>
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<td>Pemberton (1998)</td>
<td>Among those laying claims to KM are: librarianship, artificial intelligence, records management, archives management, information technology, psychology, philosophy, neurobiology, philosophy, organizational theory, information science, systems analysis, industrial training, human resources, and computer science</td>
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<tr>
<td>Armistead (1999)</td>
<td>Philosophy, economics, social science and the physical sciences are on the academic side of the scale, while the application of ICT tends towards the more pragmatic end</td>
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<td>Standards Australia (2003)</td>
<td>A primary characteristic of knowledge management is its integration of a range of business and academic disciplines including: human resource management; communications; philosophy; business management; change management; information management; information technology; sociology; organizational learning; and strategic planning</td>
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<td>Wiig (cited in Despres and Chauvel, 2000)</td>
<td>Historical efforts religion and philosophy (e.g. epistemology) psychology economics and social sciences business theory. Twentieth century efforts to improve effectiveness rationalization of work (Taylorism), total quality management, and management sciences psychology, cognitive sciences, artificial intelligence (AI), and the learning organization</td>
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<tr>
<td>Day (2001)</td>
<td>Documentation; linguistics; politics; social science Management; economics; organization theory; strategy; human resource management; cognitive psychology; epistemology; social science; creativity; information science; information systems</td>
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<tr>
<td>Despres and Chauvel (1999)</td>
<td>Management; economics; organization theory; strategy; human resource management; cognitive psychology; epistemology; social science; creativity; information science; information systems</td>
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<tr>
<td>Baskerville (1998)</td>
<td>Information economics; strategic information systems; organizational culture; organizational behaviour; artificial intelligence; quality management</td>
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<td>Skyrme (1999)</td>
<td>Business transformation; innovation; information management; knowledge-based systems; intellectual assets; learning organization</td>
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<td>Davenport and Cronin (2000)</td>
<td>Library and information science; process engineering; organizational theory</td>
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</table>
The criminal justice system

According to Maxfield and Babbie (2005, p. 42), the CJS is a field founded on many other disciplines such as sociology, economics, geography, political science, psychology, anthropology, and biology. At its basic structure, the CJS encompasses the police, courts, and corrections. The police service represents the law enforcement component, the courts process represents the adjudication, and the correction process represents the (re)making of people to suit the system. These sub-systems are related to one another (Chamelin et al., 1975) as shown in Figure 1.

In this paper we focus on the first sub-system of the CJS, which is related to policing. In particular we are only concerned with the function of the criminal investigation process, whose purpose is to control crime through the accumulation of information and generation of knowledge by an investigator to find who is involved in a crime and why it was committed (Innes, 2003).

KM concepts

A discussion of KM concepts must begin with an understanding of the core component of it, which is knowledge. A relevant definition of knowledge is provided by Davenport and Prusak (1998, p. 5):

... a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers.

Many proponents of KM agree on two general kinds of knowledge: tacit and explicit. Tacit knowledge is a personal knowledge, which is difficult to articulate or record (Bouwen, 2001). Brockmann and Simmonds (1997) argue that this kind of knowledge includes the insights and skills embedded in individuals. The second category of knowledge is explicit knowledge. Stover (2004) explains that explicit knowledge is expressed knowledge that can be used to communicate with others. When this knowledge is documented, it is codified. Codified knowledge is usually in the forms of written reports, databases, and other media. As a working definition, we adopt the one proposed by Standards Australia (2003, p. 1):

... a multi-disciplinary approach to achieving organizational objectives by making the best use of knowledge. It involves the design, review and implementation of both social and technological processes to improve the application of knowledge, in the collective interest of stakeholders.

Any discussion of KM is of questionable significance if it is not put in a proper context. Such a context normally has to do with people and organizations and involves tacit and explicit forms of knowledge.

Personal and organizational knowledge

Personal knowledge and organizational knowledge are two different yet interdependent concepts (Bhatt, 2002). Ipe (2003) states that personal knowledge is created, shared, and disseminated among individuals in an organization. Personal knowledge can be enhanced, externalised, and stored as organizational knowledge. In the organizational setting, personal knowledge is created through various means such as interaction between individuals at various levels of the organization. Organizational knowledge cannot be created without individuals and personal knowledge must be shared among individuals and
groups at various levels of the organization in order to enhance organizational effectiveness (Ipe, 2003). Knowledge sharing is important because it enables the relationship between the individual and the organization by moving personal knowledge to the organizational level. Knowledge that resides at the organizational level will enable the innovation of the organization's practices and subsequently this knowledge can help it to achieve goals and objectives (Ipe, 2003).

Organizational knowledge includes all the tacit and explicit knowledge that individuals possess about products, systems, and processes and the explicit knowledge that is codified in manuals, databases, and information systems (Bryant, 2003). It also includes routines, standard operating procedures, technological implements, and organizational artefacts (Patriotta, 2004).

Nemati (2002) asserts that organizational knowledge has become an important asset in the world economy. Organizational knowledge coupled with information technology, such as the Internet, can assist organizations in making better decisions. Nemati (2002) suggests that the interplay between tacit and explicit knowledge can create new knowledge for the development of new content or for replacing the existing content within the organization's knowledge base.

The KM antecedents

Despite many publications and discussions, there is no consensus on the meaning or application of KM. A wide range of approaches is available, both theoretical and practical, that can be used to explore and understand KM. By breaking the KM concept down to its fundamentally formative parts, we suggest it will be possible to make more concrete and useful associations between KM and the criminal investigation process. In this paper we refer to these KM parts as KM antecedents.

Determining the KM antecedents

Only a few researchers have looked at KM in terms of its parts (see Currie and Kerrin, 2004; Guptill, 2005). However, none has explicitly examined the links between KM antecedents and the criminal investigation process. To do so, we first determined the KM antecedents from the existing literature. This was done through an extensive search of the KM literature. The list of KM antecedents as understood by various authors is shown in Table I. As can be seen there is no consensus on what constitutes the antecedents of KM. There are, arguably, a number of important antecedents. Using a technique known as sample selection using key words (Im et al., 2001), we selected five core antecedents of KM: philosophy, sociology, psychology, computing and information systems, and management, which we believe can be used to better understand KM in relation to the CIP. Other KM antecedents may be relevant given other objectives. Our strategy is to deconstruct each antecedent and apply its relevant elements to the criminal investigation process.

The Links between KM antecedents and the CIP

A careful analysis of the KM antecedents and how they relate to many of the key processes and qualities inherent in the CIP was conducted [1]. Table II shows the five main antecedents that are critical to an understanding of knowledge management as well as those specific elements that are closely related to the applications of the criminal investigation. We will discuss each of the antecedents in this section. Concepts that represent an obvious linkage between KM and CIP are underscored in the following discussions.
Philosophy

The first antecedent of KM is philosophy. The term literally means love of wisdom and was coined by Pythagoras who said that philosophy is a desire of people for wisdom. Through philosophy, people are trying to bring the vagueness of consciousness of their thinking to the foreground. By so doing, their thinking will become clear and have a proper direction (Nicholson, 1939). There are many elements of philosophy, but the most relevant elements in terms of CIP are logic, ethics and epistemology.

<table>
<thead>
<tr>
<th>KM antecedents</th>
<th>Elements of KM antecedents</th>
<th>Applications of the elements of KM antecedents</th>
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<tbody>
<tr>
<td><strong>Philosophy</strong></td>
<td>Logic</td>
<td>Cognitive reasoning</td>
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<td>Ethics</td>
<td>Police code</td>
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<td>Epistemology</td>
<td>Right actions</td>
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<td>Moral rules</td>
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<td>Information (explicit knowledge)</td>
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<td>Evidence</td>
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<td>Interview (information and knowledge generation)</td>
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<td>Interrogation (information and knowledge generation)</td>
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<td><strong>Sociology</strong></td>
<td>Culture</td>
<td>Police culture</td>
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<td>Organization</td>
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<td>Organizational perspectives to act</td>
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<td>Community policing</td>
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<td>Society informants</td>
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<td><strong>Psychology</strong></td>
<td>Cognitive</td>
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<td>Attitudes</td>
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<td>Management problems</td>
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<td>Psychology tests:</td>
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<td>Mental illness</td>
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<td>Behavioral styles</td>
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<td>Personality traits</td>
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<td>Unfit for job</td>
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<td>Psychological profiling</td>
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<td>Hypnosis</td>
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<td>Cognitive interview</td>
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<td><strong>Computing</strong></td>
<td>Applications</td>
<td>Administrative systems</td>
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<td>Hardware</td>
<td>Data retrieval systems</td>
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<td>Networking</td>
<td>Analytical systems</td>
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<td>Communication Databases</td>
<td>Process control systems (CAD or 911)</td>
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<td>DNA databank</td>
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<td>Crime and Intelligence analysis</td>
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<td>AFIS (Automatic Fingerprint Identification System)</td>
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<td>GIS (Geographical Information System)</td>
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<td><strong>Management</strong></td>
<td>Personal Administration</td>
<td>Management of the investigative knowledge</td>
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<td>and managerial control</td>
<td>Management of the investigator’s actions</td>
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<td>Investigation</td>
<td>Selection and posting of resources in the CID</td>
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<td>Case management (caseload allocation)</td>
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<td>Police administration</td>
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<td>Time management</td>
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<td>Case file management</td>
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</tbody>
</table>

*Philosophy*

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Stroll and Popkin (1961) defined logic as a discipline that attempts to distinguish correct from incorrect reasoning. Innes (2003) relates investigation and logic:

The investigative methodology binds together the various methods employed by detectives to generate knowledge about crime, providing them with a grounding and unifying logic (Innes, 2003, p. 174).

Thiroux (1985) describes ethics as the study of morality based on values. One of the things that seem to distinguish human beings from other inhabitants of this planet is our desire and ability to value things.

The criminal investigators as police personnel are bounded by the police code of ethics. According to Kleinig and Zhang (1992 cited in Davis, 1995), the International Association of Chiefs of Police (IACP) produced a document entitled “Law Enforcement Code of Ethics” in 1957, which was the first ‘code of ethics’ for police. They defined a code of ethics as “a formal statement of a certain kind of practice” (p. 84). Codes of ethics are based on practices of morality and the practices of law. Based on a similar code of ethics, the investigator is expected to make the right judgements and take the right actions for the right reasons during the investigation process (Neyroud, 2003, p. 589).

Pemberton (1998) states that epistemology derives from episteme (the Greek word for knowledge), so it means the study of knowledge. Epistemology is a branch of philosophy that asks often circular questions about how we can know that we really know anything. In the criminal investigation process, Dienstein (1995, p. 160) asserts that the investigators need to answer several questions: who, what, when, where, and how? Sometimes an investigator needs to answer the why question.

It is important for the investigators to answer the entire list of questions to ensure successful prosecution and conviction of the criminal. Knowledge is also critical for the investigators, as it can prevent them from prosecuting an innocent person (Dienstein, 1995). The investigation process comprises the stages of information and knowledge generation constructed by the investigator in order to understand the crime situation. The process is not a linear sequence of actions but a more complex process, which involves mental and physical aspects of the investigator (Innes, 2003).

Maguire (2002) states that the investigative practice has two basic objectives or tasks: the generation of (investigator) “knowledge”, and the production of “evidence”. As for the first objective, knowledge refers to the conclusions and understandings reached by the investigator regarding the crime. The production of knowledge normally involves the following tasks:

- determining that one or more criminal offences have been committed;
- producing a “narrative” of the circumstances surrounding the offences;
- determining the most promising “line of inquiry”;
- identifying and/or eliminating one or more “suspects”;
- exploring the backgrounds, motivations, lifestyles and activities of suspects or “known offenders” and their associates; and

In relation to the second objective, Innes (2003) states that evidence is the information that has been selected and can be understood and represented in accordance with the logic of a legal framework. The investigative activity of the investigators is in the direction of collecting...
information that can generate knowledge and evidence that allows them to identify and charge the criminal in a court of law. Maguire (2002) points out that the production of evidence entails the following basic tasks: producing evidence that specific offences were committed (or were planned), and producing evidence to link suspected persons with particular offences.

When suspects or witnesses are required to assist the investigation, the investigators use techniques to help them to gain knowledge about the crime being investigated. The techniques help to elicit the tacit knowledge from their minds. Among the techniques used are interviewing and interrogation (Dienstein, 1995). Swanson et al. (2003) note that interviewing is the intended gathering of information from people who have or may have knowledge needed in the investigation. Investigators obtain information perceived from the five senses (sight, sound, smell, taste, and touch) of the witness. Interrogation is also used to obtain information and match it with other information about a particular suspect to secure a confession (Swanson et al., 2003). However, according to Dienstein (1995), there are legal requirements that must be followed by the investigators in obtaining information this way. Failure to adhere to the requirements will negate the use of the information gained during the interrogation as evidence in a court of law.

Sociology

The study of social influence on human behaviour can be traced back to the ancient Greeks but it was only 200 years ago that this discipline became known as a science (Coser et al., 1983). Sociology is a systematic way to understand the world and social life. The main focus of sociology is human beings and their actions. Among major themes in sociology are culture, organization, and society. The three themes are interrelated when discussed from a knowledge management perspective.

The social aspect of the investigators is always intertwined with the culture of the CID and the organizational expectations of their work. Investigators are expected to perform by solving criminal cases within a certain time and they need to clear a number of case files within that time limit. When a case is of public interest, an investigator needs to gain clear knowledge about the case in a short period of time, which later needs to be prepared as an account for the superior officers regarding the case. Some investigators spend a long time on their cases due to the complexity of the investigation. Owing to these kinds of pressures, investigators are identified as having a strong occupational culture (Innes, 2003). Manning (1995, p. 472) defined an occupational culture as “a reduced selective, and task based version of culture that is shaped by and shapes the socially relevant worlds of the occupation.” This culture serves “as a source of knowledge about ‘doing’ policing, establishing a set of background common-sense understanding of what policing means and how in a practical sense it is accomplished” (Innes, 2003 p. 14).

The influence of culture on the investigators at the organizational level is described by Innes (2003, p. 15) as:

The values and norms of detective culture are inflected by the position of this aspect of police work within the structures of the organization and its attendant stratified status hierarchies. These cultural attributes that do much to order and structure investigative practices are shaped by the range of interspersed policy, procedural, product and presentational discourses that effectively constitute the organization in a “structural” sense.

This shows that the organizational setting can influence the investigators’ actions when responding to crimes and the way they may conduct themselves during the investigation process. Investigators as actors are conditioned by the social purposes and functions of the organization of which they are members (Innes, 2003). The organization provides a “perspective” on how members are to view the world, render it meaningfully and orderly, and make it suitable to act (Weick, 1995 cited in Innes, 2003).

In a crime prevention programme, the investigators are also involved in community policing. Hatty (1991) states that community policing is a strategy used by police organizations to establish a close relationship with local community residents for the benefit of that
community in terms of security and safety. Zhao et al. (2002) argue that community policing has been shown to help reduce social disorder and crime incidents through information sharing between the police and the public. In terms of investigations, with community policing the investigator has wider access to the local criminal information about incidents in the community due to the rapport established with that community. Some of the victims and witnesses in the community have become good sources of information (informants) and knowledge for the investigator (Aguilar, 2002).

Psychology

Psychology is broadly defined as the science of behaviour and mental processes (Lefton, 1994). It uses scientific principles and well-defined methodology to present an organized body of knowledge and to make inferences. Psychologists study many aspects: observable human actions, mental processes include thinking and reasoning processes, emotions, and psychological reactions associated with biological reactions due to the emotional responses. Psychologists are expected to describe, explain, predict, and manage the basic components of behavior (Lefton, 1994).

Ainsworth and Pease (1987) believe that psychology is of some value to the serving police officer. They assert that psychology is relevant to particular tasks such as training and the handling of hostage or siege situations. Recent developments indicate that the police are increasingly interested in what psychology might offer (Brogden et al., 1988).

There are three questions normally asked by psychologists regarding police work in general. First, what kind of attitudes do police officers have; second, what kinds of skills are required of police officers; and third, what are the management problems involved in harnessing such attitudes and skills in the production of “good police practice” (Brogden et al., 1988 p. 11)? Brogden et al. (1988) point out that several studies of police personalities have answered these questions. The studies suggested that the typical police personality has characteristics such as: authoritarianism as a learned response to doing a particular kind of job in a particular organizational setting; suspicion as a consequence of the dangers of the job or specific training; and conventionalism resulting from their involvement in a disciplined paramilitary organization.

The policing skills in general are related to observation, interrogation, and situation. Observation skills require the ability of sense making, a good memory, and perceptual processes and expectancy. Interrogation skills along with incriminating evidence enable the investigator to persuade the accused to confess to the crime. Situational skills are the ability of the investigator to respond in a critical situation without escalating it.

In police training and recruitment, the use of psychology tests is well established as an entry point. Barrett et al. (2003) mention that psychology tests are commonly used in the selection of law enforcement officers before they can be accepted for recruitment training. McKenna et al. (2002) discuss the use of the Myers-Briggs Type Indicator (MBTI) for the prediction of behavioral styles that fit with certain job tasks. The MBTI test shows that police officers or detectives are inclined towards the combination of Extraversion, Sensing, Thinking and Perceiving (ESTP) (McKenna et al., 2002).

Moreover, criminal investigation has adopted a psychological method of detecting criminals, which is known as psychological profiling. Usually, this method is used to aid investigators in the investigations of serial crimes (Ratcliffe, 2004). Teten (1995, p. 475) defined psychological criminal profiling as “a method of identifying the perpetrator of a crime based on an analysis of the nature of the offence and the manner in which it was committed.” This method uses various aspects of a criminal's personality deduced from known actions before, during, and after the criminal act. This information, combined with other pertinent details and physical evidence, is then compared with the characteristics of known personality types and mental abnormalities to develop a practical working description of the offender (Teten, 1995). Holmes and Holmes (1996) suggest that psychological profiling is an essential investigative tool when the investigator deals with cases without obvious criminal motives and which can therefore be considered abnormal.
Kebbell and Milne (1998) indicate that the identification of an offender normally relies on fingerprints, DNA samples, or informers. When a crime occurs, the investigator needs assistance from the public to provide information about the crime if they have seen it. The members of the public who come forward are eyewitnesses and the method that they normally provide to the investigator in identifying suspects is using descriptive information. However, if eyewitnesses are unable to remember details of a crime, perpetrators may go unpunished; on the other hand, if eyewitnesses recall information inaccurately, innocent people may be convicted of crimes.

In relation to such evidence, psychologists have devised methods of enhancing eyewitness recall such as hypnosis and cognitive interviews (Kebbell and Milne, 1998). According to Swanson et al., hypnosis is “a means of aiding witnesses in recalling facts buried in the subconscious memory”, cognitive interviews are “an interview approach in which a witness is asked to recall events and details in different ways as a means of fostering the witness's recollections” (Swanson et al., 2003, pp. 134, 141). Both methods are used as investigative tools that suggest descriptions of the events or offenders and provide new knowledge to the investigator for further investigative actions.

Computing and information technology

In the last two decades computers have also changed the way knowledge is processed, stored, distributed, and accessed (Ceric, 2003). Thus organizations using knowledge management initiatives are inevitably involved with setting up a computing and information infrastructure. There is also a perception that this kind of technology can assist the members of the organization in performing their knowledge management tasks more efficiently (CIKM, 2003).

Generally, law enforcement agencies implement systems that can be categorised among the following: administrative systems, data retrieval systems, analytical systems, and process control systems (Stevens, 1995). Administrative systems include personnel records handling, budgeting activities, payroll processing, and other administrative duties. In addition, data retrieval systems provide information on suspect, victim, or witness identification and administrative support activities. Analytical systems may provide general information, data summaries, and statistical analysis. Among functions provided by analytical systems are criminal investigation, crime analysis, research and planning, management analysis and evaluation, manpower allocation as well as budgetary analysis and audit. Process control systems are used to support and control police. In essence, the system provides a “command and control” approach for the management of daily police activities.

At the crime scene, the investigator is concerned with two important issues: the people involved in the crime and the physical evidence that is usually present at a crime scene. Using scientific investigation, the involvement of specific people can be identified through the physical evidence left by them. The physical evidence at the crime scene includes fingerprints, bloodstains, fibres, hairs, and soil (Sagara, 1995). With the advances in computer technology, computers have been used to collect, store, and analyse the physical items found at the scene of crimes. Fingerprintst previously stored in fingerprint card files are now being scanned and stored in digital forms. Computers are now being used for fingerprint filing and searching purposes (Menzel, 1995). Bloodstains found at the crime scene
scene are now analysed using DNA analysis, which has become essential in criminal investigation with the advancement of DNA typing systems and sampling capability.

For the last two decades, the increases in computer power and digital storage and also a steady reduction in computer costs have encouraged the police to computerize their records for statistical and managerial purposes. At the same time, police realized that the same records could be used for crime and intelligence analysis such as crime mapping. Rossmo (2003) indicates that crimes do not happen at random: rather they follow certain patterns. After committing a number of crimes, the criminals leave behind a blueprint of their mental map. This mental map when entered into a computer program will produce a map showing the most probable areas that police should target. Ratcliffe (2004) mentions that law enforcement has shown interest in using geographical information systems (GIS) to map the incidence of crime occurrences, which is parallel to research activities in the identification of patterns and psychological aspects of criminals. The potential of this technology in assisting criminal research and investigation makes the police the first criminal justice agency to show considerable interest in crime mapping. Although this technology faces many obstacles at this early stage, recent developments have overcome the technical difficulties with the availability of computer mapping packages for the desktop market (Ratcliffe, 2004).

The use of KM antecedents, as distinct from generic KM, is particularly instructive in the case of computing technology. In much of the KM literature information and computing technology is considered to be one of the primary, if not the only, element of KM. This has led to less than ideal KM implementations in many organizations. By classifying computing and information technology as a KM antecedent, its proper, but still important, role in a more holistic application of KM can be better understood. In the CIP, technology plays a crucial role, but its application to the CIP cannot on its own be considered KM.

**Management**

Management is a multi-disciplinary area of study, which is best seen as a cluster of activities, roles, and tasks (Griseri, 2002). It has four operational functions: planning, organizing, influencing, and controlling (Mondy and Premeaux, 1995).

In the criminal investigation process, the investigator is involved in the management of knowledge, which is related to the investigation process and the management of actions, which is related to the line of inquiry of the investigation. At the tacit level, the investigator manages his or her own cognitive thought concerning the identification, interpretation, and ordering of knowledge with the objective of ascertaining how the crime occurred, who was involved, and how (Innes, 2003). At the explicit level, the investigator organizes the information collected in a coherent form, which is legally valid, and prepares a structured narrative description of the crime incident according to what has been investigated and considers the case for prosecution (Innes, 2003).

The management of actions is in accordance with the availability of explicit knowledge accumulated during the investigative work. Innes (2003, p. 133) describes the management of investigative actions as the interplay between information and the progress of actions:

> Many investigative actions are products of the information collected, and analysis of this interwoven, complex, mutually productive relationship and action is a difficult but necessary task, in terms of understanding the conceptual base of investigative work. Using the data collected, what becomes apparent is the way in which as an enquiry progresses the focus of the information sought shifts, as does the orientation of investigative actions designed to produce it.

Ward (1995) asserts that a key success element in the criminal investigation process is the use of case management systems. He defines case management as “a planned, coordinated, and tested way of maximizing both efficiency and productivity in the reporting and investigation of crime” (Ward, 1995, p. 58). A good case management system starts shortly after the police force become aware of a crime. However, according to Ward, despite previous studies, which tried to refine the case management system so that it can be both efficient and effective, many police departments still use “hit or miss” methods. Poor or
nonexistent managerial direction has contributed to the poor results of crime investigations in most police departments (Ward, 1995).

Ward (1995) adds that when an investigator is assigned to a case, it is his or her responsibility to follow through with it. Good case management occurs when each investigator maintains a list of active cases, records their state of development and other relevant information. The investigator should also prepare an investigative program that will include a list of results required in order to investigate the case, the strategy to be followed, and a time sequence. The time sequence should include opportunities for management review and discussion (Ward, 1995).

Since administration is synonymous with management, it is worthwhile discussing it here (Megginson et al., 1983). As an example, some aspects of police administration are related to the selection of investigators to join the CID. Cordner (1995) states that the administration side of the police is always concerned with the performance of the officers who execute government policies regarding crimes. Owing to this concern, the police administration must be selective in acquiring and posting resources to perform the criminal investigation. The personnel assigned to the CID must possess certain criteria that fit the nature of the job. Individuals assigned to criminal investigation must have the necessary basic skills, and appropriate personality for the work and the culture of the CID (Innes, 2003). Innes (2003, p. 9) describes the investigative skills as follows:

> [Investigative work is] founded upon a “dialectical” synthesis of “craft” skills blended with a “scientific” style of rationality. [It is] a mix of the rational and the intuitive, a synthesis of art and science. Good investigators were held to be possessed of a combination of fairly intuitive perceptual skills and “technical” knowledge related to crime and its investigation.

Along with the process of investigation, the investigator is required to manage a case file. A case file is a folder where the investigator collects and collates the documentation of the case under investigation. The investigator records all the actions taken during the investigation, explicitly described in codified form.

Knowledge management is sometimes regarded as an oxymoron by those who consider it somehow impossible to manage knowledge. This may be an extreme point of view, but by looking at management as an antecedent of KM it can be more directly and relevantly linked to the task at hand. In this case, we can link management concepts, which directly affect knowledge use, to the CIP.

### The criminal investigation process

Martin Innes (2003, p. 176) views the criminal investigation process as follows:

> Crime investigations are composed of a number of discrete yet linked investigative actions, which are directed towards the production of knowledge about how and why the crime occurred.

Garvin (1998) states that processes are collections of tasks and activities that are combined together and transform inputs into outputs. These inputs and outputs consist of materials, information, and people. Davenport (1993, cited in Garvin, 1998) argues that the work process entails a specific ordering of work activities across time and space, a structure for action.
The criminal investigation process in this study is synthesized from the processes and events of criminal investigation of several sources (Innes, 2003; Swanson et al., 2003). The process (Figure 2) shows how an investigator undertakes a series of sequential actions from the time a crime is reported to the police (or the police detected the crime themselves) until a case is constructed. The main events of the process are: crime reported or detected by police, preliminary investigation, follow-up investigation, suspect development, and case construction. Each process is briefly discussed (for a more detailed description see Nordin and Pauleen, 2005).

**Crime reported or detected by police**

Reporting a crime is normally the initial stage of a criminal investigation. Reports can be in verbal or written form regardless of the nature of the case, and also incidents can be reported via telephone. Reports may be lodged by the public or by the police themselves.

**Preliminary investigation**

This is the stage when an investigator receives the crime report. The investigator will read the report thoroughly to understand and make sense of the incident or situation. In a case where a patrol officer is the first responder to the case, this officer will attend the case and conduct a preliminary investigation.

**Follow-up investigation**

In the follow-up investigation, the investigator gains information subsequent to the preliminary investigation. This involves visiting the crime scene, and interviewing witnesses and suspects.

**Suspect development and apprehension**

The main objective of an investigation is to find the offender behind the incident and also the motives for the crime. With all the information and evidence accumulated at this stage, the investigator may be able to identify and locate a suspect.

**Case construction**

In this stage the police need to "legalize" the information that they have collected and organized to form a coherent, legally valid, structured narrative account of what the investigator believes has taken place in the crime incident (Innes, 2003).

**The investigator**

The CIP is usually conducted by an investigator, who is a police officer, allowed to exercise all or any of the special powers in relation to police investigation given by the law (Criminal Procedure Code, 2003). According to Innes (2003), a good investigator is required to have both intuitive skills and technical knowledge. Intuitive skills indicate that an investigator is capable of functioning at several levels: physical, emotional, mental, and spiritual (Vaughan, 1979, cited in Yoong, 1999). The underlying knowledge that forms personal competence in carrying out the investigation can include both tacit and explicit knowledge. The tacit knowledge explains how things happen while the explicit has the potential to explain why

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**Figure 2** The major criminal investigation stages
things happen. Tacit and explicit knowledge are components of mental models (Koskinen, 2003).

Kim (1993) explains that the investigator views the crime situation through mental models. These provide the context in which to view and interpret new material, and they determine how stored knowledge is relevant to a given situation. According to Kim (1993), they represent more than a collection of ideas, memories, and experiences: they also help the investigator to make sense of the world.

Similarly, an investigator must have the personal integrity to face physical, emotional, and material temptations. At a technical level, the investigator must have a sound knowledge of the techniques and procedures required in a criminal investigation. Socially, the investigator must have a good knowledge of and understanding of people, their mental processes, their culture, their customs, and their environment (Dienstein, 1995).

In sum, many elements of an investigator’s work can be directly linked to the KM antecedents discussed earlier. The usefulness of the KM antecedents in understanding and enhancing the investigator’s role in the CIP are mapped in Figure 3.

**KM antecedents and the CIP: a conceptual model**

Figure 3 presents a conceptual model of knowledge management and the criminal investigation process (KM-CIP). The KM-CIP model comprises three main constructs: the KM antecedents, the criminal investigation process, and an investigator. The model shows the involvement of the investigator in each event of the criminal investigation process in the context of the police organization. The legend of this model shows two-way arrows that represent the relationships between the constructs.
The usefulness of the model lies in its power to break down the usually difficult-to-understand concept of KM into its more manageable and applicable antecedents.

Conclusion

In this paper we have tried to show why it is important to understand the roots of KM and how such an understanding can help make KM more relevant to particular applications in organizational or practitioner contexts. Specifically, we have discussed five core antecedents of KM and shown the linkage between these antecedents and the application of the elements of the antecedents within the criminal investigation process. The proposition that KM is a multi-disciplinary subject was established through the association of the antecedents that we have put forward in this paper. The conceptual model of KM-CIP shows how the KM antecedents can be mapped and linked to the CIP. In this relationship, the personal knowledge of the investigator is used in every stage of the CIP, whether to make decisions or to advance the investigation according to the leads of the inquiry. The antecedents of KM have certain roles in supporting the CIP as well as the investigator. The model can point to ways in which a police organization can use KM to augment police procedures.

In this conceptual article we did not attempt to rate the relative importance of the antecedent disciplines, and we acknowledge that some CIP applications as stated may be located in multiple antecedents (i.e. tacit knowledge). We also acknowledge there may be overlap between antecedents (i.e. sociology and psychology). Rather, our goal has been to illustrate how KM antecedents can be used to link KM in a meaningful way with CIP. We believe that the antecedents and the conceptual model in this paper can be useful for police organizations, both from the perspective of academics and practitioners in the criminal justice system to better understand the discipline of KM particularly in the context of law enforcement related work.

Future research is encouraged to extend this conceptual model so that it can be adapted to other situations related to criminal investigation, the criminal justice system, and criminology. We also urge researchers and practitioners to consider the use of relevant KM antecedents when applying KM to specific professional and organizational contexts, processes and practices.

Note

1. The first author was a member of the Royal Malaysian Police and was trained in CIP.

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Further reading


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