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# An Empirical Investigation of the Willingness of US Intelligence Community Analysts to Contribute Knowledge to a Knowledge Management System (KMS) in a Highly Classified and Sensitive Environment

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by

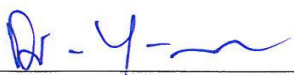
Robert J. Hambly, Jr.

A dissertation submitted in partial fulfillment of the requirements for the degree of  
Doctor of Philosophy  
in  
Information Systems

College of Engineering and Computing  
Nova Southeastern University

2016

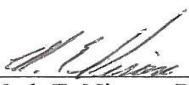
We hereby certify that this dissertation, submitted by Robert Hambly, conforms to acceptable standards and is fully adequate in scope and quality to fulfill the dissertation requirements for the degree of Doctor of Philosophy.

  
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Date

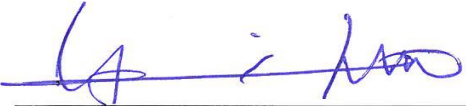
  
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By my side through this journey has been my soulmate and forever love – my darling bride Priscilla. No one is more proud of this achievement, and no one is happier to see it conclude. She has the patience of a saint and inspires me by her love and devotion.

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This dissertation would not have been possible without the guidance and influence of my Expert Panel. I shall not name names in the interest of respecting your requests for anonymity. Nevertheless, know that without your intervention, counsel, and recommendations, this dissertation would never have seen the light of day.

To the men and women of the US Government Intelligence Community, thank you for your participation in this research study. Because of you – your professionalism, dedication, unwavering diligence, and willingness to share knowledge – we sleep safely in our beds at night. Our Nation is in your debt!

An Abstract of a Dissertation Submitted to Nova Southeastern University in Partial  
Fulfillment of the Requirements for the Degree of Doctor of Philosophy

An Empirical Investigation of the Willingness of US Intelligence  
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by  
Robert J. Hambly, Jr.  
December 2016

Since September 11, 2001, the United States Government (USG) has possessed unparalleled capability in terms of dedicated intelligence and information collection assets supporting the analysts of the Intelligence Community (IC). The USG IC has sponsored, developed, and borne witness to extraordinary advances in technology, techniques, and procedures focused on knowledge harvesting, knowledge sharing, and collaboration. Knowledge, within successful (effective & productive) organizations, exists as a commodity; a commodity that can be created, captured, imparted, shared, and leveraged.

The research problem that this study addressed is the challenge of maintaining strong organizational effectiveness and productivity through the use of an information technology-based knowledge management system (KMS). The main goal of this study was to empirically assess a model testing the impact of the factors of rewards, power, centrality, trust, collaborative environment, resistance to share, ease-of-using KMS, organizational structure, and top management support to inducement, willingness to share, as well as opportunity to contribute knowledge to a KMS on knowledge-sharing in a highly classified and sensitive environment of the USG IC.

This study capitalized on prior literature to measure each of the 15 model constructs. This study was conducted with a select group of USG Departments and Agencies whose primary interest is Intelligence Operations. This study solicited responses from more than 1,000 current, as well as former, Intelligence Analysts of the USG IC, using an unclassified anonymous survey instrument. A total of 525 (52.5%) valid responses were analyzed using a partial least squares (PLS) structural equation modeling (SEM) statistical technique to perform model testing. Pre-analysis data screening was conducted to ensure the accuracy of the data collected, as well as to correct irregularities or errors within the gathered data. The 14 propositions outlined in this research study were tested using the PLS-SEM analysis along with reliability and validity checks. The results of this study provide insights into the key factors that shed light onto the willingness of US intelligence community analysts to contribute knowledge to a KMS in a highly classified and sensitive environment. Specifically, the significance of a knowledge worker's willingness to contribute his/her knowledge to a KMS along with the opportunity to contribute knowledge, while inducement was not a significant factor when it comes to knowledge sharing using KMS in highly classified environments.

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## Chapter 1

### Introduction

#### **Background**

Since September 11, 2001, the United States Government (USG) has possessed unparalleled capability, as well as capacity, in terms of dedicated Intelligence and information collection assets supporting the analysts of the Intelligence Community (IC) (Central Intelligence Agency, 2005). The USG IC has sponsored, developed, and borne witness to extraordinary advances in technology, techniques, and procedures focused on knowledge harvesting, knowledge sharing, and collaboration (Nissen & Leweling, 2010; Rosenzweig, 2005). Significant resources have been committed towards the realization of high-risk/high-payoff solutions that promote information exchange, knowledge transfer, and collaboration between the various Intelligence gathering, analysis, and reporting organizations (U.S. Department of Homeland Security, 2012; White House, 2003). Success in this area was not realized without much angst and trepidation being experienced by its participants (Igbaria, Parasraman, & Baroudi, 1996; Lee, Kim, & Kim, 2012). Knowledge and information technology stovepipes, as well as cultural silos, had to be negotiated so that pathways of communication could be established (Finnegan & Willcocks, 2006; Griesinger, 1990; H. Hall, 2001). Where none had existed before, bonds of trust and an infrastructure of relationships had to be established and nurtured (Desouza, 2003; Hickson, Christopher, Charles, & Rodney, 1971; Kuo, 2013; Rockett & Valenti, 2013). The issues associated with breaking down technical and cultural barriers have proven to be difficult – yet significant (Abdolvand, Albadvi, & Ferdowsi, 2008). These concerns, however, have paled in comparison to the challenges of establishing,

sustaining, and nurturing the personal relationships between collaborating analysts (Riege, 2005; Kuo, 2013; Rockett & Valenti, 2013; White House, 2003).

An understanding of the USG IC's knowledge sharing challenge emerges from *The 9/11 Commission Report* within which members of the Commission (former Governor of New Jersey Thomas H. Kean & Congressmen Lee H. Hamilton of Indiana) spoke to the issue of "the pervasive problems of managing and sharing information across a large and unwieldy government" (p. xvii). The Intelligence and Counter-Terrorism (CT) agencies of the USG are responsible for collecting, processing, and analyzing massive amounts of Intelligence data. The IC and CT agencies, as well as their activities, convert this data into information that can be fused into actionable Intelligence (i.e., knowledge) – disseminating promptly and in a usable form (Nissen & Leweling, 2010; Popp, Armour, Senator, & Numrych, 2004). Addressing the culture of the IC, which has been roundly criticized for failing to anticipate the 9/11 terrorist attacks, the report stated, "even the best information technology will not improve information sharing so long as the Intelligence agencies' personnel and security systems reward protecting information rather than disseminating it" (p. 88).

The commission determined that had IC Analysts been provided with the appropriate information technology (i.e., Knowledge Management Systems (KMS)) – capable of connecting the knowledge/information repositories containing the relevant, actionable Intelligence already in-hand – the deadliest attack on U.S. soil could have been thwarted (Popp et al., 2004). In the aftermath of the attacks on 9/11, significant, actionable information (i.e., knowledge) was left behind – the significance of which was not generally understood until after the attack (National Commission on Terrorist Attacks

Upon the United States, 2004; Popp et al., 2004). The Commission determined that the USG was responsible for its internal failures – hemorrhaging from an almost systematic, often self-imposed, self-directed lack of coordination and knowledge sharing among the government agencies (National Commission on Terrorist Attacks Upon the United States, 2004).

This research study was designed to empirically validate a model testing the impact of the factors of *rewards, power, centrality, trust, collaborative environment, resistance to share, ease-of-using KMS, organizational structure, and top management support to inducement, willingness to share*, as well as *opportunity* to contribute knowledge to a KMS facilitating knowledge-sharing in a highly classified and sensitive environment. The balance of this paper argued for the study of the model and its validation. Following the problem statement, this chapter addressed the research goals of this study as well as identifying the propositions that stem from the research question. Addressed next was the relevance and significance of the research conducted in this study. A brief review of the literature was then presented encompassing each of the theories and constructs introduced in this study. Next, the specific instruments used to measure each of the 15 constructs were presented. Specific assumptions, limitations, delimitations, and barriers affecting this study were discussed. Finally, the specific data analyses that were used to compare each of the 15 constructs were presented, as well as a definition of terms.

## **Problem Statement**

The research problem that this study addressed is the challenge of maintaining strong organizational effectiveness and productivity through the use of KMS (Beer & Nohria, 2000; Benbya & Belbaly, 2005; Burley & Pandit, 2009; Furner, Mason, Mehta, Munyon, & Zinko, 2009). As demonstrated by Kankanhalli, Tan, and Wei (2005), the mere presence of a KMS does not guarantee successful knowledge harvesting, knowledge sharing, and knowledge management within an organization (Boland, Tenkasi, & Teeni, 1994; Damodaran & Olphert, 2000). Success, in terms of leveraging KMS in support of organizational effectiveness and productivity, depends upon the employee's active and continuous use of these systems to share knowledge (Boland et al., 1994; Butler & Murphy, 2007; Chan & Chau, 2005; Constant, Sproull, & Kiesler, 1996).

One challenge that organizational leadership has faced is the question of 'from whom should knowledge be harvested' (Chourides, Longbottom, & Murphy, 2003)? Too often, knowledge harvesting has been focused upon a few highly paid, highly placed, elite contributors in the organization rather than the majority of the workers who are focused on common work processes thought of as routine (Hambrick & Mason, 1984). In taking this approach, the practical inventiveness often demonstrated by the majority of the workers to negotiate the limits of the process are lost to the organization (Brown & Duguid, 2000; Duxbury, 2014; Elbana, 2006). Practical inventiveness is a critical aspect of knowledge harvesting because actual work practices are rife with improvisations (tacit knowledge) that the executing employees would have trouble articulating (Alavi & Leidner, 2001; Duxbury, 2014; Elbana, 2006).

The value of personal relationships (trust building) has been evident no more so than in the case of the organizations, activities, and agencies focused on the Global War

On Terrorism (GWOT) (MacDonald & Oettinger, 2002; Popp, Armour, Senator, & Numrych, 2004). The USG has faced emerging challenges associated with protecting and cultivating its investment in KMS (Markus & Benjamin, 1996; Nonaka, 2005). In addition to protecting the intellectual capital captured within the KMS, the integrated and inter-related relationships established between individuals, departments, activities, organizations, and agencies has required constant servicing and further cultivation (Taylor, 2005). *Intellectual Capital* being defined as “the sum of everything everybody in the company knows that gives it a competitive edge” (Stewart, 1997, p. ix). Stewart (1997) further defined intellectual capital as “knowledge, information, intellectual property experience – that can be put to use to create wealth (effectiveness and productivity)” (p. x) based upon brainpower.

In their report concerning barriers to organizational effectiveness and productivity impacting upon the IC in Afghanistan, Flynn, Pottinger, and Batchelor (2010) observed, “the most salient problems are attitudinal, cultural, and human” (p. 9). Adding to the conundrum is that, over time, the IC as a whole has become a culture that is “emphatic about secrecy but regrettably less concerned about mission effectiveness” (p. 9). The key to success, Flynn et al. (2010) argued, is the establishment of mutually beneficial relationships, and facilitating knowledge sharing with everyone who needs it. However, it appears that knowledge harvesting to establish and develop KMS, a precursor to facilitating knowledge sharing, is a significant challenge; especially in such highly classified and sensitive environments (Flynn, Pottinger, & Batchelor, 2010). Popp et al. (2004) described the challenge as one in which “all elements of the government have to share information and coordinate operations” (p. 40). Organizational barriers (i.e.,



information silos & cultural insularities) must be broken down and overcome. *Sharing* entails understanding and resolving multiple perspectives in a contextually complex environment (Popp et al., 2004). Keen (1981) defined innovation and change, within an organization, as “an intensely political process” (p. 24). Innovation and change, while ensuring continued organizational effectiveness and productivity, would be a function of coalition building – by and among those who understand, articulate, orchestrate, and facilitate the organizational end state desired (Gold, Molhatra, & Segars, 2001; Grover & Davenport, 2001). The goal of the knowledge sharing solutions is to empower analysts with the requisite tools to detect, analyze, and interpret the meaning of these clues so that appropriate counter-measures can be taken by decision-makers to pre-empt such attacks (Popp et al., 2004).

Taken from the epistemology of the social sciences, *Socio-economic Theory* contends that individuals would behave in a manner consistent with the promotion and realization of their self-interests (Smelser & Swedberg, 2005; Wagner, Frick, & Schupp, 2007). Accordingly, it follows that when engaged in a knowledge exchange, individuals would be inclined to contribute knowledge in and under circumstances only when they have something to gain (Grant & Baden-Fuller, 2004; Gray, 2001; Hyoungh & Moon, 2002). Building upon existing research focused on *Inducement* and *Opportunity* factors influencing the use of Electronic Knowledge Repositories (EKR), Subramanian and Soh (2009) argued that these two factors – Inducement and Opportunity – are the principal motivational factors contributing to an individual’s proclivity to contribute to an electronic knowledge repository. Subramanian and Soh (2009) examined each of these factors in terms of a supporting framework of *incentives* (descriptors) for each factor. The

antecedents of *reward*, *power*, and *centrality* further defined inducement. Reward, such as promotion, salary increases, and awards – as an effective incentive – is supported by the research of Beer and Nohria (2000), Davenport and Prusak (1998), H. Hall (2001), as well as Xu, Kim, and Kankanhalli (2010) among many others. Power, often described as an individual's status or position in an organization – as a contributing factor – is substantiated by the work of Pfeffer (1981) as well as Brass and Burkhardt (1992). As introduced by Subramanian and Soh (2009), the final incentive element – centrality – is closely linked to power in that it does refer to one's status and position within an organization. But, it all focuses on the individual's ability and capability to facilitate information- and knowledge-sharing, as well as the individual being positioned to influence access to people and other resources (Brass & Burkhardt, 1992; Pfeffer, 1981). Coase (1937) and Becker (1976), in their discussions of *Social Cognitive Theory (SCT)*, described human behavior as the interaction between environmental factors, personal factors, and behaviors. The triumvirate relationship between environmental factors, personal factors, and behaviors is both interactive as well as reciprocal in nature (Compeau & Higgins, 1995). The second construct described by Subramanian and Soh (2009) is opportunity, characterized by the elements of top management support, organization structure, and ease of use in using EKR. *Ease of use* as an incentive for an individual contributing to a knowledge system has been well researched and reported. Argote, McEvily, and Reagans (2003), Davis (1989), Boland et al. (1994), as well as Venkatesh (2000) consistently described ease of use as a matter of individual perception and preference. Organization structure, as a contributing factor, implies that the infrastructure is in-place that would support a knowledge contribution being made by any

employee at any place within the organization's hierarchy (Constant, Sproull, & Kiesler, 1994; Jarvenpaa & Staples, 2000). Finally, top management support, centers on the importance that organizational leadership places on the use of the EKR as a part of creating, nurturing, and maintaining a knowledge-sharing, collaborative environment (Gold et al., 2001; Orlikowski, 1993). Notably, Hambrick and Mason (1984) argued that the "strategic choices and performance levels" of organizations can be "partially predicted" (p. 193) by the type of top management support prevailing within the organization.

Subramanian and Soh (2009), as reflected in the results of their study, did not adequately demonstrate that the factors of Inducement and Opportunity – independently or in combination – explain an individual's likelihood to contribute to an EKR. It is also noteworthy that Subramanian and Soh (2009) recognized that one of the limitations of their study is the fact that their research was built upon the examination of a single organization and, as such, is subject to "single source bias" (p. 59). Moreover, the population used within their study was limited to single category of organizational employees (software engineers). As a result, while limited research has been published on Inducement and Opportunity as factors contributing to the likelihood of an individual to contribute to an EKR, the results are inconclusive – indicating that a knowledge gap exists – and additional research is warranted, especially within the context of highly classified and sensitive environments.

### **Dissertation Goal**

The main goal of this study was to empirically assess a conceptual model to test the impact of the factors of *reward, power, centrality, trust, collaborative environment, resistance to share, ease-of-using KMS, organization structure, and top management support to inducement, willingness to share*, as well as *opportunity* to contribute knowledge to a KMS on knowledge-sharing in a highly classified and sensitive environment of the USG IC. An added dimension of this study goal was to empirically assess the influence of an organization's culture, as well as the organization's establishment and promotion of a collaborative environment, as a function of an effective organization (Baron & Kenny, 1986; Beaudry & Pinsonneault, 2005; Triandis, 1994). This study concentrated on organizational effectiveness, efficiency, and productivity within the context of a dynamic, highly classified and sensitive environment. The scope of this study was both intra- and inter-organizationally based. The target population of this study encompassed intelligence professionals working as analysts in a wide variety of intelligence organizations within the IC. One of the attributes of the IC is its diversity in terms of both job skills sets and operational environments. The focus of this study centered on the *willingness* of analysts within a segment of the Department of Defense (DoD) community to contribute (i.e., knowledge harvesting) to a knowledge base supporting collaborative activities via a KMS. The perception among operations as well as intelligence leaders is that knowledge supporting and enabling situational awareness and decision-making, is available but is not being shared (U.S. Department of Defense, 2010).

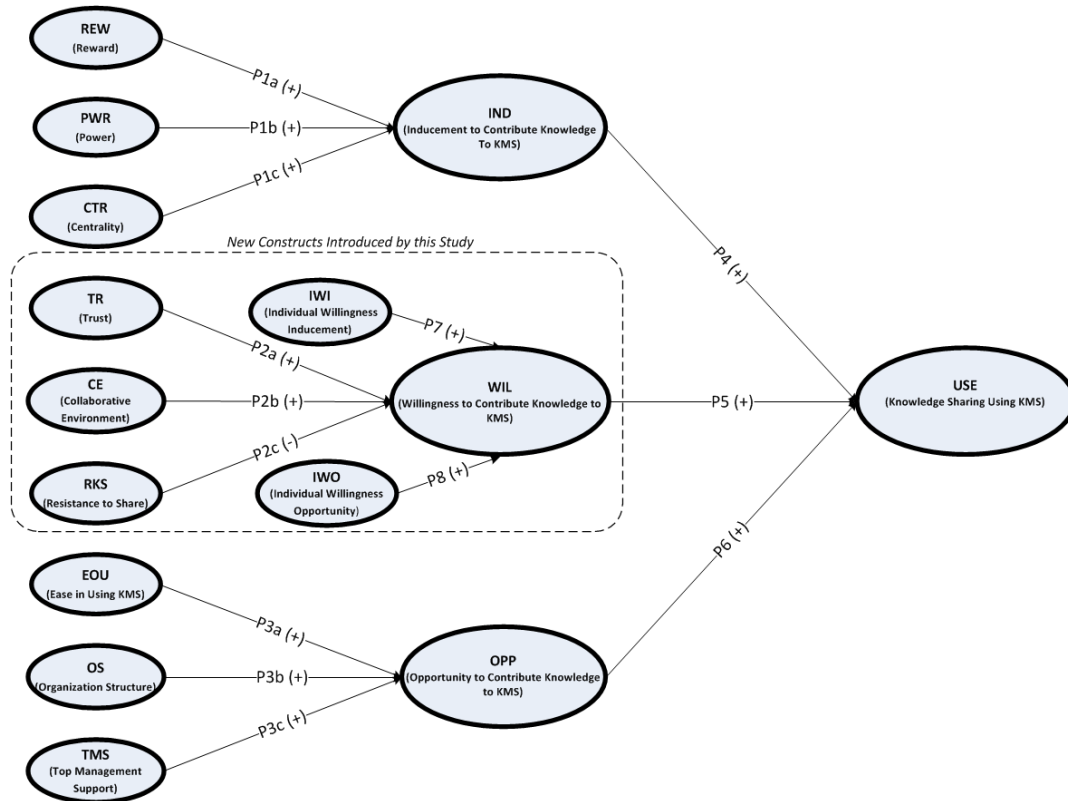
This study builds upon the impact of the *inducement* factors encompassed within the Subramanian and Soh (2009) theoretical model, the constructs of *reward, power,*

*centrality, organization structure, and top management support.* This study examines the *opportunity* to influence same, as well as assess their impact on an individual's *willingness to share* in contributing knowledge for the purpose of establishing as well as sustaining KMS in a highly classified and sensitive operational environment (Boland et al., 1994). As depicted in Figure 1, this study centered on a new set of *constructs* focused on an analyst's willingness to contribute knowledge *to a KMS* (Devaraj & Kohli, 2003; Faniel & Majczak, 2002). These new constructs are: the degree or measure of *Trust* imbued in the KMS (including trust in an analyst's fellow knowledge contributors & KMS users), the creation and sustainment of a *Collaborative Environment*, and an examination of an analyst's *Resistance to Share* in a collaborative environment supported by KMS (Burkhardt & Brass, 1990; Constant et al., 1996). Additionally, the impact of *inducements* on an analyst's *individual willingness to contribute knowledge to a KMS*, as well the impact of *opportunity* on an analyst's *individual willingness to contribute knowledge to a KMS* was introduced (Bandura, 1986; Compeau & Higgins, 1995; Kankanhalli, Tan, & Wei, 2005). Most importantly, the need for this work is argued for as demonstrated by the outcomes published by Subramanian and Soh (2009) concerning the relevancy of both *inducement* and *opportunity* as factors influencing an employee to contribute to a knowledge base. In the findings from their research, inducement and opportunity do not rise to the level of validity (i.e., being statistically significant) one would expect as key factors motivating employees to become contributing members to the knowledge base supporting a collaborative, knowledge sharing environment (Davis, 1989; Jarvenpaa & Staples, 2000; MacDonald & Oettinger, 2002).

The revised conceptual model – an *Inducement-Willingness-Opportunity*

*Framework* – highlighting the new constructs introduced within this study, are as shown

in Figure 1.



**Figure 1:** The Inducement-Willingness-Opportunity Framework on the Use of KMS by Knowledge Contributors

This study focused on an added dimension – *Willingness to Contribute Knowledge to KMS* – in this context, *resistance* to knowledge harvesting and knowledge sharing in a highly classified or sensitive collaborative environment supported by KMS (Griesinger, 1990; Huber, 2001; U.S. Department of Defense, 2010). The new factor – *Willingness to Contribute Knowledge to KMS* – was established on the constructs of *Trust*, *Collaborative Environment*, and *Resistance to Share*.

Individuals will commonly turn to other individuals for information and knowledge before turning to a faceless source (Allen, 1977; Mintzberg, 1973; Pelz & Andrews, 1966). Research conducted by Levin and Cross (2004) affirmed that this preference exists even with individuals who have ready access to the power and capability of the Internet. Mayer, Davis, and Schoorman (1995) defined *trust* as

“the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party.” (p. 712)

According to Gambetta (1988), *trusting* someone means, “he will perform an action that is beneficial or at least not detrimental to us” (p. 217). Trust, in the use of KMS, is often an individual matter. Characteristically, a lack of trust in a fellow employee is a barrier to collaboration and knowledge sharing (Riege, 2005). An employee’s perceived *trust* in a collaborative environment will demonstrate a significantly positive influence on his/her *willingness* to contribute knowledge to the KMS.

The value of *collaborative environments* as an influence on individual knowledge harvesting is grounded in *Social Exchange Theory* (Cook, 1977; Emerson, 1962; Homans, 1958; Tiwana & Bush, 2001). Social Exchange Theory is focused on the behavior of the individual, and the interpersonal network that exists between individuals (Blau, 1964; Emerson, 1962). An individual’s desire to establish a personal relationship, and to remain committed to that relationship, is derived from a sense of obligation to not only that other individual, but also one’s personal beliefs and cultural values (Johnson, 1973). The underlying principle of the social exchange framework is that “each party in a dyad exchanges in a diverse set of exchanges to influence each other and attain the most

favourable outcomes – that is, to maximize rewards and minimize costs” (p. 204) (Byers & Wang, 2005). Successful organizations are those that have learned to parlay their collective expertise and knowledge – within the context of an integrated, collaborative framework – resulting in unprecedented productivity, efficiency, and innovativeness (Argote & Ingram, 2000; Levin & Cross, 2004; Lucas, 2007). A. Cabrera and E. F. Cabrera (2002) suggested that shared knowledge contributes to the “public good” in that every member of the organization derives benefit from the knowledge sharing whether or not they have contributed” (p. 693). Tapscott and Williams (2006) claimed that collaborative environments facilitate complex problem-solving and, in-turn, complex problem solving fuels collaborative learning. Seng, Zannes, and Pace (2002) suggested that collaborative learning should provide sufficient knowledge for efficient – and more effective – decision-making. In literature, the value of a KMS is normally assessed based upon its technical capabilities (Hendriks, 1999; Hendriks & Vriens, 1999). In actuality, the assessment should be based on the question, ‘Does the supporting KMS motivate an individual to provide knowledge for sharing’ (Hendriks, 1999; Pee, Kankanhalli, & Hee-Woong, 2010; Tissen, Andriessen, & Lekanne Deprez, 2000)? An employee’s perceived value of a *collaborative environment* within the organization will demonstrate a significantly positive influence on his/her *willingness* to contribute to the KMS (Kankanhalli et al., 2005).

As defined by Folger and Skarlicki (1999), resistance is “employee behavior that seeks to challenge, disrupt, or invert prevailing assumptions, discourses, and power relations” (p. 36). Abdolvand, Albadvi, and Ferdowsi (2008) noted that resistance is considered be a “negative readiness factor” with respect to an organization’s adaptability



and capability in the face of change (p. 488). An individual's *resistance to share* can be attributable to many elements. Greenhalgh and Rosenblatt (1984) have pointed to the dynamics of "job insecurity" as a potential consideration, especially as it relates to organizational restructuring (p. 438). Jacoby and Terpstra (1990) examined the importance of creating an environment in which an individual can function autonomously – where mutual trust, as well as respect, are encouraged and accorded. Cheng-Hua, Yuan-Duen, Wei-I, and Li-Ting (2007) suggested, through an empirical study, that trust must be given as well as proffered on multiple levels – between co-workers, supervisors, and organizations. Riege (2005) argued that resistance to sharing can be a function of many factors including differences in age, differences in gender, differences in experience levels, differences in education levels, differences in culture or ethnic background, to name but a few (pp. 23-24). It was noted in literature that an employee's perceived *resistance to share* within a collaborative environment would demonstrate a significantly negative influence on his/her *willingness* to contribute to the KMS (Folger & Skarlicki, 1999). Within literature, there appears to be an assumption that knowledge harvesting (& exchange) will occur naturally and automatically – once the knowledge harvesting, collaborative procedures, processes, and technologies are in place (Kankanhalli et al., 2005). This study proposed that once the human element is introduced into the equation, this assumption becomes improbable (Heiman & Nickerson, 2004; van den Hoof, Schouten, & Simonovski, 2012).

Defining the concept of *willingness* is difficult to isolate within literature (May, Gilson, & Harter, 2004). This predicament occurs because the definition of *willingness* is generally taken for granted and, when discussed, is normally context specific.

Simplistically, *willingness* can be defined as freedom from reluctance (Kahn, 1990; May, Gilson, & Harter, 2004). *Willingness* is a “multi-dimensional construct,” meaning that it is a property that can be influenced (Héliot & Riley, 2010, p. 402). This study proposed that *willingness* is a malleable and measurable entity influencing knowledge harvesting and collaboration (Huang & Huang, 2012; Wasko & Faraj, 2005).

### **Research Question and Propositions**

The main research question this study addressed is: What is the impact of the factors of *reward*, *power*, *centrality*, *trust*, *collaborative environment*, *resistance to share*, *ease-of-using KMS*, *organization structure*, and *top management support to inducement*, *willingness to share*, as well as *opportunity* to contribute knowledge to KMS on knowledge sharing in a highly classified and sensitive environment? The main research question that this study addressed is defined by three distinct investigative elements: (1) the degree of *trust* that a contributor has in his colleagues; and, within the boundaries of the organization’s culture, the perceived employee’s level of *trust* the contributor has ascribed to his organization’s leadership and management; (2) the evolving boundaries of the *collaborative environment* in which the individual operates; and, (3) the contributor’s innate *resistance to sharing* knowledge. All three aspects contribute to the contributor’s *willingness* to share knowledge and to, ultimately, contribute to the organization’s KMS.

The specific research propositions that this study addressed are (see Figure 1):

P1a: An employee’s perceived *reward* will demonstrate a significant positive influence on his/her *inducement* to contribute knowledge to the KMS.

- P1b: An employee's perceived increase in *power* within the organization will demonstrate a significant positive influence on his/her *inducement* to contribute to the KMS.
- P1c: An employee's perception of increased *centrality* within the collaborative hierarchy will demonstrate a non-significant positive influence on his/her *inducement* to contribute to the KMS.
- P2a: An employee's perceived *trust* in a collaborative environment will demonstrate a significant positive influence on his/her *willingness* to contribute knowledge to the KMS.
- P2b: An employee's perceived value of a *collaborative environment* within the organization will demonstrate a significant positive influence on his/her *willingness* to contribute to the KMS.
- P2c: An employee's perceived *resistance to share* within a collaborative environment will demonstrate a significant negative influence on his/her *willingness* to contribute to the KMS.
- P3a: An employee's perceived *ease of use* in the supporting technology within the collaborative environment will demonstrate a significant positive influence on his/her *opportunity* to contribute knowledge to the KMS.
- P3b: An employee's perceived value of a *supportive organization structure* will demonstrate a significant positive influence on his/her *opportunity* to contribute to the KMS.

- P3c: An employee's perceived value *top management support* of the collaborative environment by will demonstrate a significant negative influence on his/her *opportunity* to contribute to the KMS.
- P4: An employee's *inducement* to contribute knowledge to the KMS will demonstrate a significant positive influence on his/her knowledge sharing using KMS.
- P5: An employee's *willingness* to contribute to the KMS will demonstrate a significant positive influence on his/her knowledge sharing using KMS.
- P6: An employee's *opportunity* to contribute to the KMS will demonstrate a significant positive influence on his/her knowledge using KMS.
- P7: An employee's *individual willingness inducement* to contribute to the KMS will demonstrate a significant positive influence on his/her *willingness* to contribute knowledge to the KMS.
- P8: An employee's *individual willingness opportunity* to contribute to the KMS will demonstrate a significant positive influence on his/her *willingness* to contribute knowledge to the KMS.

## **Relevance and Significance**

### *Relevance*

The relevance of this study is that it both supports and builds upon the body of the knowledge related to the challenge of maintaining strong organizational effectiveness and productivity through the use of KMS (Beer & Nohria, 2000). The purpose of a KMS is "to support the creation, transfer, and application of knowledge in organizations" (Alavi & Leidner, 2001, p. 107). The research literature pertaining to the development and

implementation of KMS is both rich and extensive encompassing a number of research disciplines (Fuller, 2002; Tuomi, 2002; Firestone & McElroy, 2003). Peachey, Hall, and Cegielski (2005) have compiled a compendium of KM research studies reflecting publication in a wide variety of discipline-related journals including management, hospitality, health care, economics, and information systems (IS). Of note, the dominant trend of the published research centers is concentrated on *knowledge transfer*; irrespective of the discipline/business function supported by KM or KMS (Peachey, Hall, & Cegielski, 2005). In the case of this study – *knowledge transfer* as supported by a KMS – was examined in a highly classified and sensitive environment.

Although considerable management practice literature has been published focused on incentives introduced into a collaborative environment structured to motivate knowledge workers to transfer knowledge, a definitive knowledge gap exists with respect to inducements used in support of the use of KMS (Huber, 2001; Osterloh & Frey, 2000). Knowledge management literature is also replete with research conducted in the use of motivators (e.g., rewards & incentives) to encourage knowledge sharing (Bartol & Srivastava, 2002; Kankanhalli et al., 2005; Subramanian & Soh, 2009). A closer examination of the results published in literature underscores the indeterminate value that motivators have – as causal factors – underpinning a knowledge worker's motivation for contributing to knowledge sharing through a KMS (Balkin & Gomez-Mejia, 1987; Shin, 2004; Simonin, 1999; Spender & Grant, 1996).

This study empirically assessed a model designed to test the impact of *inducement, opportunity, and willingness to share* as factors supporting a knowledge worker's decision to contribute to KMS operating in a collaborative environment

(Kankanhalli et al., 2005; Subramanian & Soh, 2009). Prior research has centered on the constructs of inducement and opportunity as incentive behind the use of KMS by knowledge workers (Ba et al., 2005; Bock, Zmud, & Kim, 2005; Subramanian & Soh, 2009; Wasko & Faraj, 2005). Building upon the research of Subramanian and Soh (2009), this study introduced a new set of constructs concentrating on an individual's *willingness to share* – contribute to knowledge harvesting – in support of KMS operating in a highly classified and sensitive environment. To date, empirical research centering on an individual's willingness to share in a collaborative environment – as a motivational factor – remains relatively unexplored and poorly understood (Lam & Lambermont-Ford, 2010; Milne, 2007; Osterloh, Frost, & Frey, 2002).

### *Significance*

The significance of this study is corroborated by both the continuing interest and investment the USG IC has made in collaborative, knowledge-sharing systems (i.e., KMS) (Flynn et al., 2010). This interest in knowledge sharing and collaboration, using supporting KMS in a highly classified and sensitive environment, will continue into the foreseeable future (Schaab, DeCostanza, & Hixson, 2011). In discussing the limitations of their study, Subramanian and Soh (2009) commented that future studies conducted in “research contexts where tacit knowledge is valued more than explicit knowledge can give a better understanding of the factors influencing the usage of knowledge management systems” (p. 59). The USG IC is a community that fits within the organizational research context suggested. As recognized by Flynn et al. (2009) the results of this research will be of great interest to the USG IC community KM practitioners who have significant equities in knowledge harvesting, knowledge sharing,

collaboration, as well as KMS operating in a highly classified and sensitive environment. Additionally, the results from this study will contribute to the body of knowledge concerning the identification and understanding of the fundamental factors motivating knowledge workers to contribute to knowledge harvesting in support of KMS. Research communities of interest will be able to use the results of this study to shape future research into motivation, incentives, inducements, as well as organizational culture as they relate to knowledge sharing and collaboration using KMS.

### **Barriers and Issues**

The most significant barrier to knowledge sharing and collaboration through KMS is – people (Lam & Lambermont-Ford, 2010.). Employees, who can acquire new knowledge and skills, are an organization's most adaptive resource (Davenport & Prusak, 1998). Research literature asserts that technology can both increase and decrease knowledge transfer through its effects on the interpersonal contact between knowledge workers (Brown & Duguid, 2000).

It has also been shown through research literature, that an organization that uses *knowledge fusion* for knowledge generation intentionally introduces conflict and complexity into the process to develop synergies for success (Heffner & Sharif, 2008; Sage & Rouse, 1999). An organization's ability to adapt is critical to its long-term survival (Szamosi & Duxbury, 2002). The ability to transfer knowledge is key to an organization's effectiveness and productivity (Alavi & Leidner, 2001). Knowledge is transferred in an organization whether the process is managed or not (Davenport & Prusak, 1998). Most researchers submit that tacit to explicit knowledge conversion is difficult, if not impossible, despite advances in research in communications technologies

(Lindvall, Rus, & Sinha, 2003; Small & Sage, 2006; Smith, 2001). These are the realities that define/describe knowledge sharing and collaboration as a backdrop to the use of KMS in a highly classified and sensitive environment.

Dutton, Dukerich, and Harquill (1994) argued that an organization's *culture* plays a pivotal role in the likelihood that employees will be willing to work together and share their knowledge. In most organizations, knowledge workers are already task saturated (Beer & Nohria, 2000; Bock et al., 2005; Burkhardt & Brass, 1990). The additional time required to harvest and share personal knowledge may mean changing an established work process, adding additional steps for the purpose of facilitating knowledge harvesting in support of a KMS (Propp, 1999; Raghu & Vinze, 2007; Sabherwahl & Becerra-Fernandez, 2003). Harvesting and sharing knowledge will leave management with the additional burden of demonstrating a need for the change in the process (Davis, 1989; Hendricks, 1999; May et al., 2004; Sabherwahl & Becerra-Fernandez, 2003).

As discussed by B. P. Hall (2001), "Knowledge creates knowledge only when it is shared" (p. 19). The relational composition of a group will invariably affect the quality of a team decision (Propp, 1999). From an organization cultural perspective, team members may be reluctant to share knowledge (Desouza, 2003; Emerson, 1962). Some knowledge workers will be disinclined to share because they fear criticism from their peers (Blau, 1964). Others will be concerned with criticism or retribution from senior leadership or management for sharing proprietary organizational knowledge with the competition (Lucas, 2005; Mowery, Oxley, & Silverman, 1996). If the culture fosters or supports an atmosphere of mistrust or lack of respect, subversion of the partnering effort may result (Folger & Skarlicki, 1999; Mohr & Spekman, 1994). A mismatch in individual and



organizational goals may have the same consequence (Gulati, 1995). At the individual-level, where professional knowledge is often viewed as a source of power, people are often reluctant to share knowledge (Quinn, Anderson, & Finkelstein, 1996).

As examined and assessed in this study, a rewards system may or may not be an inducement to contributing to a KMS (Subramanian & Soh, 2009). Based on what an individual knows and what s/he contributes to the KMS, the knowledge worker may have an expectation of reward and/or advancement within the organization (Bartol & Srivastava, 2002; Mayer et al., 1995; Milne, 2007). Conversely, once an individual's knowledge is surrendered to the KMS, s/he may have a sense of diminished personal value once the 'know-how' is surrendered (Gray, 2001; Huang & Huang, 2012). Once a reward system is instituted, there is an inherent danger that the volume of knowledge within a KMS may increase, but the quality of the knowledge may decrease (Hendriks, 1999; Hyoungh & Moon, 2002).

Collaboration within the IC involves partners from different organizations, some of who pursue diverse or conflicting objectives (Central Intelligence Agency, 2005). Often, in addressing problem sets, the partners use different processes and technologies (Hansen, 1999). Unrestricted levels of knowledge sharing, good communication, and a well thought out, well-orchestrated plan for coordination could provide the motive, opportunity, and structure for a successful KMS (Damadaran & Olphert, 2000). But, if knowledge workers do not see the benefit of a KMS, they will not use it (Alavi & Leidner, 1999, 2001; Chan & Chau, 2005; Butler & Murphy, 2007; Firestone & McElroy, 2003). Additionally, KMS that require a great deal of upkeep may tend to fall into disuse and decay due to the latency of the information (Shum, 1997).

The USG IC is generally viewed as a secretive culture, with a compartmented mentality (Central Intelligence Agency, 2005). It is a community that exists and functions behind cipher locks and non-disclosure agreements. Within the IC, there exists an atmosphere of professional jealousy and competitiveness, challenges that must be mitigated or overcome to ensure organizational effectiveness and productivity (Central Intelligence Agency, 2005). Within the context of this study, the last major barrier/issue to be negotiated is the risk of ‘exposure’ to outside interests who would welcome an opportunity to inflict injury or harm to the agencies and activities who would provide analysts as participants for this study (Bock et al., 2005; Grant & Baden-Fuller, 2004; Heiman & Nickerson, 2004). These ‘risks’ would have to be carefully considered and mitigated through *trust*.

### **Assumptions, Limitations, and Delimitations**

#### *Assumptions*

Within literature, there appears to be an assumption that knowledge harvesting (& exchange) will occur naturally and automatically – once the knowledge harvesting, collaborative procedures, processes, and technologies are in place (Kankanhalli et al., 2005). This study proposed that once the human element is introduced into the equation, this assumption becomes improbable (Heiman & Nickerson, 2004; van den Hoof, Schouten, & Simonovski, 2012).

#### *Limitations*

According to Ellis and Levy (2009), a study limitation is defined as an “uncontrollable threat to the internal validity of the study” (p. 332). This study has some

limitations. A limitation of this study is that its respondent population has been restricted to intelligence analysts who were, or are currently, employed by the USG. Another limitation is that this study is focused on intelligence analysts who have used a KMS in support of Operation Enduring Freedom and/or Operation Iraqi Freedom. An additional limitation is that the results of this study might be biased by the USG's IC's organizational culture (Central Intelligence Agency, 2005). The organizational context chosen for study would also limit the generalizability of the results achieved. The IC, as a culture, places greater value on tacit knowledge than explicit knowledge (Central Intelligence Agency, 2005). Future studies in different research contexts would contribute to understanding the generalizability of the research model underpinning this study.

Another limitation of this study was access to the survey instrument. As administered, the survey instrument was only accessible through a commercial (i.e., public) unclassified Website. Many USG IC environments restrict access to unclassified and public Websites from work site locations. In these cases, the survey respondents were required to complete the survey from home or some other non-work site location. These factors may have influenced the survey results.

### *Delimitations*

According to Creswell (2003), delimitation narrows the focus of the study. Leedy and Ormrod (2005) submitted that delimitation is described as the boundaries of the study. This study developed a research model investigating the antecedents (Inducements, Willingness, & Opportunity) of knowledge sharing, collaboration, and encouragement by others to share knowledge via a KMS.

A conceptual model, leveraging a literature review drawn from several fields of study, was developed based on these constructs on KMS usage. Knowledge sharing exists at many levels of an organization. This study focused on the IC of the USG, and the motivation factors contributing to knowledge sharing within this designated group.

### **Definition of Terms**

Many research disciplines are interested in KM. As a result, ambiguity in terminology occurs. The definitions that follow are intended to mitigate and eliminate fragmented understanding of the KM terminology used in this study.

**Agency Theory** – an individual’s preference when, as a decision maker, one must select one alternative (act, course of action, & strategy) from a recognized set of decision alternatives when the outcome of that selection is unknown (Fishburn, 1970).

**Attribution Theory** – Explains how individuals interpret events and how that interpretation subsequently affects their behavior and decision-making. Positive outcomes reinforce trusting beliefs; negative outcomes decrease some aspects of trustworthiness (Chen, Wu, & Chang; 2013; Tomlinson & Mayer, 2009; Weiner, 1974).

**Bootstrapping** – a resampling technique that draws a large number of subsamples from the original data (with replacement) and estimates models for each subsample. It is used to determine standard errors of coefficients to assess their statistical significance with relying on distributional assumptions. Generally, 5,000 or more samples are recommended.

**Centrality** – the degree to which one believes one can increase in degree and closeness to others within the organization (establishing oneself in a position of influence) because

of knowledge contributions to the organization (Yli-Renko, Autio, & Sapienza, 2001).

**Collaboration** – the process of individuals who differ in notable ways sharing information and working towards a particular purpose (Amabile, Patterson, Mueller, Wojcik, Odomirock, & Marsh, 2001).

**Collaborative Environment** – the use of information technologies specially designed to support human interaction and teamwork (Marjanovic, 1999).

**Computer Self-Efficacy (CSE)** – an individual’s belief in his/her ability to use computers (technology) in the determination of computer (technology) use when faced with a new or unfamiliar situation (Compeau & Higgins, 1995).

**Contingency Theory** – Contingency theories hold that “there is a fit the organizational structure and the contingency that has a positive effect on performance” (Donaldson, 2001, p. 10).

**Critical t value** – is the cutoff or criterion on which the significance of a coefficient is determined. If the empirical t value is larger than the critical t value, the null hypothesis of no effect is rejected. Typical critical t values are 2.57, 1.96, and 1.65 for a significance level of 1%, 5%, and 10% respectively (two-tailed tests) (Hair, Hult, Ringle, & Sarstedt, 2017).

**Culture** – is that complex whole which includes knowledge, belief, arts, morals, law, customs, and any other capabilities as well as habits acquired by man as a member of society (Tylor, 1871, p. 1)

**Data** – a set of discrete, objective facts about events.

**Ease of Use** – Degree to which IS is perceived to be free of effort (Davis, 1999; Smith et al., 1999).

**Endogenous latent variables** – serve only dependent variables or as both independent and dependent variables in a structural model.

**Electronic Knowledge Repository** – A sub-type of Knowledge Management System (KMS) that is designated as a *repository model*. The benefit of these repositories includes time and cost savings realized by leveraging existing knowledge rather than creating new knowledge (Kankanhalli et al., 2005).

**Empirical t value** – is the test statistic value obtained from the data set at hand (here: bootstrapping results) (Hair, Hult, Ringle, & Sarstedt, 2017).

**Explicit Knowledge** – knowledge that is transmittable in formal, systematic language (Nonaka, 1994).

**Inducement** – as measured by the user’s willingness to contribute knowledge (Bock et al., 2005; MacInnis, Moorman, & Jaworski, 1991).

**Information** – facts organized to describe a situation or condition (Wiig, 1993).

**Intellectual Capital** – being defined as “the sum of everything everybody in the company knows that gives it a competitive edge” (Stewart, 1997, p. ix).

**Knowledge** – a mix of framed experiences, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information (Tsoukas & Vladimirou, 2001). Knowledge is actionable information (Chan & Chau, 2005; Stein, 2005). Simply stated, it is the individual and organization’s know-how (Alavi & Leidner, 2001).

**Knowledge Fusion** – processes that integrate knowledge, technologies, and other organizational resources. Fusion processes resolve conflicting ideas, generate changes to

the organizational environment, as well as to the characteristics of the organization and its components (Heffner & Sharif, 2008).

**Knowledge Management** – identifying and leveraging collective knowledge for a competitive advantage (Nissen, 2006; von Krogh, 1998). Knowledge management is normally concerned with capturing an organization's *know-how* and *know-what* through knowledge creation, harvesting, storage, dissemination, and application (Miller, 1999).

**Knowledge Management System (KMS)** – a class of (generally) information technology-based systems for managing knowledge within organizations facilitating knowledge creation, capture, storage, retrieval, and knowledge sharing (Alavi & Leidner, 2001).

**Knowledge Sharing** – critical activities of transferring or disseminating knowledge from one person, group, or organization to another (Lee, 2001, p. 324).

**Knowledge Worker** – someone who adds value by processing existing information to create new information that could be used to define and solve problems (Drucker, 1959).

**Opportunity** – Perception of whether the user was given a chance to contribute knowledge or, whether they were constrained by any aspect of the organization in contributing knowledge (MacInnis et al., 1991). The possibilities that are available to any entity within any environment (Siverson & Starr, 1990).

**Organization Structure** – structure as defined by rules, procedures, and hierarchy of reporting relationships that aid in sharing knowledge (Gold et al., 2001).

**Organizational Support Theory** – Organizational support theory supposes that employees personify the organization, infer the extent to which the organization values their contributions and cares about their well-being, and reciprocate such perceived

support with increased commitment, loyalty, and performance. On the basis of these assumptions, organizational support theory provides a general approach to the role of the reciprocity norm in employee–employer relationships (Rhoades & Eisenberger, 2002, p. 711-712).

**p value** – is, in the context of a structural model assessment, the probability of error for assuming that a path coefficient is significantly different from zero. Researchers compare the p value of a coefficient with a significance level selected prior to the analysis to decide whether a path coefficient is statistically significant (Hair, Hult, Ringle, & Sarstedt, 2017).

**Partial least squares structural equation modeling (PLS-SEM)** – is a variance-based method to estimate structural equation models. The goal is to maximize the explained variance of the endogenous latent variables.

**Power** – the ability or the right to control people and/or things; the degree to which one believes that he/she can increase power and value gained due to a knowledge contribution (Kankanhalli et al., 2005).

**R<sup>2</sup> values** – are the amount of explained variance of endogenous latent variables in the structural model. The higher the R<sup>2</sup> value, the better the construct is explained by the latent variables in the structural model that point at via structural path relationships. High R<sup>2</sup> values also indicate that the values of the construct can be well predicted via the PLS path model (Hair, Hult, Ringle, & Starstedt, 2017)

**Resistance to (Knowledge) Sharing** – the competitive individualism, supporting individual effort and ability, that does not support cooperation and the sharing of expertise (Orilkowski, 1993).



**Reward** – The importance of economic incentives provided for knowledge contribution (Ba et al., 2001; Kankanhalli et al., 2005).

**Self-Efficacy (Self-efficacy Theory)** – an individual's perception of his/her ability to organize and execution actions necessary to achieve a specified performance level in specified tasks (Bandura, 1997; Compeau, Higgins, & Huff, 1999).

**Social Cognitive Theory (SCT) – (from IS Theory)** posits individual self-perception of efficacy (ability) as a key determinant in an individual's skills acquisition and task performance (Bandura, 1986). Describes human behavior as the interaction between environmental factors, personal factors, and behaviors (Compeau & Higgins, 1995).

**Socio-Economic Theory – (from Economics Theory)** contends that individuals would behave in a manner consistent with the promotion and realization of their self-interests (Smelser & Swedberg, 2005). When engaged in a knowledge exchange, individuals would be inclined to contribute knowledge in and under circumstances only when they have something to gain (Grant & Baden-Fuller, 2004; Gray, 2001; Hyoungh & Moon, 2002).

**Social Exchange Theory (SET) – (from IS Theory)** is focused on the behavior of the individual, and the interpersonal network that exists between individuals (Blau, 1964; Emerson, 1962). At the organization-level, it defined as an organization's belief that the other organization will perform in a manner that will result in positive outcomes for both organizations; and, that the other organization will take no action that will result in negative outcomes for either organization (Gulati, 1995).

**Tacit Knowledge** – implicit with the knower, it is deeply rooted in the comprehensive understanding of the human mind; based upon action, commitment, and connection within a specific context (Nissen, 2006; Nonaka, 1994).

**Task-Technology Fit (TTF)** – the correspondence between task requirements, individual abilities, and the functionality of the technology (Goodhue & Thompson, 1995).

**Theory** – “building blocks encompassing the necessary components and means of representation, constructs, relationships between the constructs” (Gegor, 2006, p. 634).

**Theory of Reasoned Action (TRA)** – assumes that human beings are rational and make systematic use of the information available to them (Fishbein & Ajzen, 1975). TRA is widely accepted in social psychology to explain virtually any human behavior (Sheppard, Hartwick, & Warshaw, 1988).

**Top Management Support** – Perception of management support in contributing knowledge (Lewis, Agarwahl, & Sambamurthy, 2003).

**Trust** – a person’s willingness to depend on another individual’s actions that involve opportunism (Williams, 2001; Zand, 1972). *Trusting* an individual means “the probability that he (or she) will perform an action that is beneficial or at least not detrimental to us is high enough for us to consider engaging in some form of cooperation with him (or her)” (Gambetta, 1988, p. 217).

**Utility Theory** – An individual’s preference when, as a decision maker, s/he must select one alternative (act, course of action, & strategy) from a recognized set of decision alternatives when the outcome of that selection is unknown (Fishburn, 1970). Utility theory provides a structured approach supporting the evaluation of choices made by individuals, firms, and organizations (Keeney & Raiffa, 1993). Utility measures each

choice for the satisfaction it provides to the decision maker (Starmer, 2000). Utility theory assumes that all decisions are made based on the utility maximization principle, in which the best choice is the one that provides the highest utility to the decision maker (Hammond, Keeney, & Raiffa, 2002).

**Willingness** – related to an individual’s calculations of advantages and disadvantages, cost and benefit, considered on both a conscious and unconscious level. Through willingness, an individual recognizes opportunities and then translates those opportunities into alternatives that are weighed/weighted in some manner (Siverson & Starr, 1990).

**Willingness to Share** – motivators that enable employees to share knowledge (Wasko & Faraj, 2005).

### **List of Acronyms**

**BPR** – Business Process Reengineering

**CKO** – Chief Knowledge Officer(s)

**CT** – Counter-Terrorism

**DoD** – Department of Defense

**EOU** – Ease of Use

**GCSS** – Group Communications Support System

**GDSS** – Group Decision Support System

**GWOT** – Global War On Terrorism

**IC** – Intelligence Community

**IS** – Information Systems

**KM** – Knowledge Management

**KMS** – Knowledge Management System

**MNC** – Multi-National Corporation

**PLS** – Partial Least Squares

**SCT** – Social Cognitive Theory

**SET** – Social Exchange Theory

**SEM** – Structural Equation Modeling

**TRA** – Theory of Reasoned Action

**USG** – US Government

## **Summary**

This chapter served as an introduction to this research study, identified the research problem to be addressed, defined the main goal of the research study, presented a theoretical- and literature-based review underpinning this research initiative, identified the research questions and propositions, as well as providing a literature-based discussion addressing the relevance and significance of this research effort. The research problem this study addressed is the challenge of maintaining strong organizational effectiveness and productivity through the use of KMS (Beer & Nohria, 2000; Benbya & Belbaly, 2005; Burley & Pandit, 2009; Furner et al., 2009). The main goal of this study was to empirically assess a conceptual model to test the impact of the factors of *reward, power, centrality, trust, collaborative environment, resistance to share, ease-of-using KMS, organization structure, and top management support to inducement, willingness to share, as well as opportunity* to contribute knowledge to a KMS on knowledge-sharing in the context of the highly classified and sensitive environment of the USG IC.

This study builds upon the impact of the *inducement* and *opportunity* factors encompassed with the Subramanian and Soh (2009) theoretical model. This study also assessed the impact of inducements and opportunity factors on an individual's *willingness to share* in contributing knowledge to a KMS (Boland et al., 1994). In this chapter, a new research model was proposed centering on a new set of constructs focused on an intelligence analyst's willingness to contribute his/her knowledge to a KMS (Devaraj & Kohli, 2003; Faniel & Majczak, 2002). These new constructs were: the degree or measure of *Trust* imbued in the KMS, the creation and sustainment of a *Collaborative Environment*, and an examination of an analyst's *Resistance to Share* in a collaborative environment supported by KMS (Burkhardt & Brass, 1990; Constant et al., 1996).

This chapter also served to introduce three theories underpinning knowledge sharing within a collaborative environment. *Socio-economic Theory* (from Economics Theory) contends that individuals will behave in a manner consistent with the promotion and realization of their self-interests (Smelser & Swedberg, 2005). Accordingly, it follows that when engaged in a knowledge exchange, individuals will be inclined to contribute knowledge in and under circumstances only when they have something to gain (Grant & Baden-Fuller, 2004; Gray, 2001; Hyoungh & Moon, 2002). The value of collaborative environments as an influence on individual knowledge harvesting is grounded in *Social Exchange Theory (SET)* (Cook, 1997; Emerson, 1962; Homans, 1958; Tiwana & Bush, 2001). SET (from IS Theory) is focused on the behavior of the individual, and the interpersonal network that exists between individuals. The critical nature of collaborative environments is also associated with *Social Cognitive Theory*

(SCT). SCT (from IS Theory) describes human behavior as the interaction between environmental factors, personal factors, and behaviors (Compeau & Higgins, 1995). The triumvirate relationship between environmental factors, personal factors, and behaviors is both interactive as well as reciprocal in nature (Compeau & Higgins, 1995).

The main research question of this study posed is: What is the impact of the factors of *reward, power, centrality, trust, collaborative environment, resistance to share, ease-of-using KMS, organization structure, and top management support to inducement, willingness to share*, as well as *opportunity* to contribute knowledge to KMS on knowledge sharing in a highly classified and sensitive environment? The main research question that this study addressed is defined by three distinct investigative elements: (1) the degree of *trust* that a contributor has in his colleagues; and, within the boundaries of the organization's culture, the perceived employee's level of *trust* the contributor has ascribed to his organization's leadership and management; (2) the evolving boundaries of the *collaborative environment* in which the individual operates; and, (3) the contributor's innate *resistance to sharing* knowledge. All three aspects contribute to the contributor's *willingness* to share knowledge and to, ultimately, contribute to the organization's KMS. This confirmatory, as well as exploratory research study, addressed the 14 specific research propositions outlined in Figure 1.

The relevance of this research study is also encompassed in this chapter, including a detailed discussion as to how the research study both supports and builds upon the body of knowledge related to the challenge of maintaining strong organizational effectiveness and productivity through the use of KMS (Beer & Nohria, 2000). It is worth noting that, although considerable management practice literature has been published focused on

incentives introduced into a collaborative environment structured to motivate knowledge workers to transfer knowledge, a definitive knowledge gap exists with respect to inducements used in support of the use of KMS (Huber, 2001; May, Korczynski, & Frenkel, 2002; Osterloh & Frey, 2000). This chapter also includes a closer examination of the results published in literature underscores the indeterminate value that motivators have – as causal factors – underpinning a knowledge worker’s motivation for contributing to a knowledge sharing through a KMS (Balkin & Gomez-Mejia, 1987; Shin, 2004; Simonin, 1999; Spender & Grant, 1996).

Within this chapter, the significance of this study is corroborated by both the continuing interest and investment the USG IC is continuing to make in collaborative, knowledge-sharing systems (i.e., KMS) (Flynn et al., 2010). As recognized by Flynn et al. (2009) the results of this research will be of great interest to the USG IC community as well as its KM practitioners who have significant equities in knowledge harvesting, knowledge sharing, collaboration, as well as KMS operating in a highly classified and sensitive environment. Additionally, the content of this chapter argues that the results from this study will contribute to the body of knowledge concerning the identification and understanding of the fundamental factors motivating knowledge workers to contribute to knowledge harvesting in support of KMS.

The final sections of this chapter encompass a literature-based discussion focused on the limitations, delimitations, barriers, and issues associated with this research study. This chapter also argues that the most significant barrier to knowledge sharing and collaboration through KMS is – people (Lam & Lambermont-Ford, 2010.). Employees, who can acquire new knowledge and skills, are an organization’s most adaptive resource

(Davenport & Prusak, 1998). Research literature asserts that technology can both increase and decrease knowledge transfer through its effects on the interpersonal contact between knowledge workers (Brown & Duguid, 2000). The ability to transfer knowledge is key to an organization's effectiveness and productivity (Alavi & Leidner, 2001).

According to Ellis and Levy (2009), a study limitation is defined as an "uncontrollable threat to the internal validity of the study" (p.332). A limitation of this study was restricting its respondent population to intelligence analysts who were, or are currently, employed by the USG. Another limitation is that this study is focused on intelligence analysts who have used a KMS in support of Operations Enduring Freedom and/or Iraqi Freedom. An additional limitation is that the results of this study might be biased by the USG's IC's organizational culture (Central Intelligence Agency, 2005).

According to Creswell (2003), *delimitation* narrows the focus of the study. Leedy and Ormrod (2005) submitted that delimitation is described as the boundaries of the study. This study developed a research model investigating the antecedents (Inducements, Willingness, & Opportunity) of knowledge sharing, collaboration, and encouragement by others to share knowledge via a KMS. A conceptual model, leveraging a literature review drawn from several fields of study, was developed based on these constructs on KMS usage. This chapter concludes with a listing of terms and acronyms used within the context of this research study.



## Chapter 2

### Review of the Literature

#### **Introduction**

This study draws on quality literature to support the conceptual model put forward. Analysis of the supporting literature begins with identifying quality, peer-reviewed journals providing relevant content pertaining to the 15 constructs presented in this study's model. The literature review provides important theoretical foundations for this study. The literature review is drawn from fields of research encompassing IS, organizational, economics, as well as the social sciences fields of study. The key factors relating to the model constructs introduced in this research study within literature are synthesized to form the conceptual framework introduced in this study. This literature-based conceptual framework provides the theoretical foundations for an empirical assessment of the impact of the factors of *reward, power, centrality, trust, collaborative environment, resistance to share, ease-of-using KMS, organization structure, and top management support to inducement, willingness to share*, as well as *opportunity* to contribute knowledge to a KMS on knowledge-sharing in a highly classified and sensitive environment of the USG IC.

#### **Knowledge**

Understanding the definition and use of the term *knowledge* begins with an understanding of the terms data and information. Within IS literature, it has been consistently argued that data, information, and knowledge are not interchangeable terms (Stenmark, 2001). Illustrative of the problem, Kogut and Zander (1992) described information as facts, numbers, or symbols – while also defining it (within the same

research study) as “knowledge which can be transmitted without loss of integrity” (p. 19). Based upon this Kogut and Zander (1992) offering, information is a form of knowledge. Alavi and Leidner (2001) have described knowledge as personalized information that is held in the mind of the individual. Nonaka (1994) has argued that knowledge and information are similar in some aspects and contexts, but different in others. Nonaka (1994) has also suggested that information is factual, whereas knowledge is about beliefs and commitment. According to the research of Earl and Scott (1998), knowledge is more complex, subtle, and multivariate than information. Dougherty (1999) suggested that information only becomes valuable as knowledge when it is combined with personal experience. While data and information are useful building blocks for constructing new knowledge, Nonaka and Takuechi (1995) suggested that both data and information require knowledge to be interpretable.

In an effort to provide clarity with respect to the distinctions between the terms *data*, *information*, and *knowledge*, this study would respect the following definitions. *Data* would be defined as “a set of discrete, objective facts about events” (Davenport & Prusak, 1998, p. 2). *Information* would be defined as facts organized to describe a situation or condition (putting data into context) (Wiig, 1993). Finally, *knowledge* would be defined as *actionable information* (Chan & Chau, 2005; Stein 2005).

As recognized antecedents to strong organizational effectiveness and productivity, the terms *knowledge*, *knowledge harvesting*, *knowledge sharing*, and *knowledge management* warrant closer examination (Sabherwahl & Becerra-Fernandez, 2003; Argote, McEvily, & Reagans, 2003). The root word in all four terms is *knowledge*. Schultze and Stabell (2004) noted that a “complete and agreed upon definition of

knowledge remains elusive” (p. 551). The examination of the fundamental question of ‘what is knowledge?’ and the philosophy-derived pursuit for a simple, compelling answer to it – can be traced back to ancient Greece. The answer is rooted in (arguably) Plato’s greatest work on epistemology (the division of philosophy that examines the nature & origin of knowledge) – the *Theaetetus* (Stern, 2002). The *Theaetetus* offers two juxtaposed thoughts concerning knowledge. The first, *empiricism*, proceeds from the theory that knowledge is realized through perception (i.e., achieving understanding through the senses), and perception alone. The second thought advances that *knowledge* can be defined as *true belief*, wherein for a *belief* (something accepted or trusted) to be true, it must be substantiated not only by one’s belief that it is true, but that there is incontrovertible evidence to support the belief (Nonaka & Takeuchi, 1995). As articulated by Huber (1991) and Nonaka (1994), this *justified belief* empowers the action of the individual and the organization. Tsoukas and Vladimirou (2001) defined knowledge as a “mix of framed experiences, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information” (p. 974). Knowledge, simply stated, is the individual and organization’s know-how (Alavi & Leidner, 2001).

It is important to address the two main forms of knowledge that are consistently acknowledged in literature – *explicit knowledge* and *tacit knowledge* (Polanyi, 1966). Explicit knowledge is commonly defined as “knowledge that is transmittable in formal, systematic language” (Nonaka, 1994, p. 16). Tacit knowledge is typically described as being “implicit with the knower” (p. 24), which makes it difficult to formalize and communicate (Nissen, 2006). Tacit knowledge is deeply rooted in the comprehensive

understanding of the human mind; based upon action, commitment, and connection within a specific context (Nonaka, 1994). Hendricks and Vriens (1999) described “tensions” that exist between tacit knowledge at the level of the individual and the level of the organization, as well as between knowledge that people possess as opposed to that which can be represented as recorded procedures, guides, tutorials, etc. Conversely, tacit knowledge essentially defies capture and explanation (Hendriks & Vriens, 1999; Polanyi, 1966).

Knowledge, within successful (effective & productive) organizations, exists as a commodity; a commodity that can be created, captured, imparted, shared, and leveraged (Brynjolfsson, 1994; Gold, Malhotra, & Segars, 2001). Polanyi (1966) realized that knowledge exists in two basic forms: (1) explicit knowledge that is relatively easy to codify and can be shared asynchronously; as well as, (2) tacit knowledge that is experiential and most often is exchanged through face-to-face encounters. Explicit knowledge is relatively easy to identify and quantify (Zack, 1999). Explicit knowledge also lends itself to dissemination and sharing through supporting organizational information technology systems (Kühn & Abecker, 1997). Explicit knowledge *alone*, however, does not make for a productive and effective organization (Smith, 2001; Wyatt, 2001). Much like an iceberg, the tacit (unrecorded) knowledge obtainable within an organization is barely visible, with the greatest proportion (90%) *hidden* ‘below the waterline,’ or better yet, in the minds of the employees (Bhardwaj & Monin, 2006). The essence of an effective and productive organization lies in its tacit (implicit) knowledge (Bhardwaj & Monin, 2006; Choo, 2000; Polanyi, 1966). Once knowledge has been created, knowledge harvesting (capture) is the first, foundational step leading to the

establishment of effective knowledge sharing, as well as the creation and sustainment of a collaborative environment (Taylor, 2005). Because tacit knowledge resides within the mind of the individual, is closely tied to his/her senses and previous experiences, the world he/she knows is unique to that given individual (von Krogh, 1998). For knowledge to provide an organization with a sustainable competitive advantage, that knowledge must be independent (harvested) from any given individual and stored in a KMS (p. 2) (Myers, 1996).

*Knowledge* is actionable information (Chan & Chau, 2005; Stein 2005). Once harvested, knowledge sharing - facilitated by KMS - can improve an organization's effectiveness and productivity (Davenport, DeLong, & Beers, 1998; Stein, 2005). Through sharing, the knowledge can be used to position the organization for success (Chan & Chau, 2005; Stein, 2005). Nonaka (1994) described knowledge sharing as essential to knowledge creation in an organization. An individual's perspective of the world is shaped by the interaction between knowledge, experience, and judiciousness in their lives. As Nonaka (1994) stated, "these perspectives remain personal unless they are articulated and amplified through social interaction" (p. 22). Table 1 reflects a summary of literature related to *knowledge* – its findings and contributions.

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Table 1. Summary of Knowledge Literature

<b>Study</b>	<b>Methodology</b>	<b>Sample</b>	<b>Instrument / Construct</b>	<b>Main Findings or Contributions</b>
Huber, 1991	Theoretical	Commentary	Four constructs: Knowledge Acquisition; Information Distribution; Information Interpretation;	Research study contributes to a more complete understanding of

			Organizational Memory consisting of five sub-constructs: Congenital Learning; Experiential Learning; Grafting; and, Searching and Noticing	organizational learning.
Kogut & Zander, 1992	Theoretical	Commentary	Information, Knowledge, and Organizational Intellectual Capital	Organizational productivity and effectiveness is a function of capturing and transferring individual tacit knowledge.
Brynjolsson, 1994	Theoretical	Commentary	Organizational significance of Information Ownership and Information Technology	Analyzed the incentive effects of different knowledge ownership arrangements.
Nonaka, 1994	Theoretical	Hands-on experience with Japanese organizations	Organizational Knowledge	Organizations play a critical role in capturing and transferring individual tacit knowledge.
Nonaka & Takuechi, 1995	Theoretical and Structured Interviews	20 Japanese organizations; 130 managers	Knowledge Creation; Tacit and Explicit Knowledge; Innovation	Study identified two types of knowledge: explicit

				(recorded and can be shared with others) and implicit (derived from practical experience – can only be shared through analogy and metaphor).
Polyani, 1996	Theoretical	Commentary	Tacit and Explicit Knowledge	Empirical study defining and describing the critical nature of tacit knowledge within the organization.
Kühn & Abecker, 1997	Theoretical; Case Studies	Commentary; Case Studies	Corporate or Organizational Memory (Knowledgebase)	Three case studies examining each Company's accumulated know-how and other knowledge assets.
Davenport, DeLong, & Beers, 1998	Interviews	31 KM projects conducted in 24 organizations	Knowledge	Investigated 8 factors affecting an organization's ability to create, share, and disseminate knowledge.
Leonard & Sensiper, 1998	Theoretical	Commentary	Tacit Knowledge	Research study determined

				tacit knowledge created in groups is relevant to innovation.
Von Krogh, 1998	Theoretical	Commentary	Cognitive Perspective; Cognitive Revolution Perspective; Constructionist Perspective	Argued that there are four barriers to knowledge creation: (1) need for a legitimate language (known and acceptable to the members); (2) stories and habits; (3) formal procedures; (4) organizational paradigms.
Dougherty, 1999	Theoretical	Commentary	KM and Information Technology	Research study contributed to the understanding the means facilitating knowledge transfer.
Earl & Scott, 1999	Theoretical	20 CKOs located in North America and Europe	CKOs have two principal design competencies: technologist & environmentalist	Model CKO requires multiple competencies to leverage knowledge.
Hendricks & Vriens,	Theoretical	Commentary	Knowledge-Based Systems	KBS term in literature



1999			(KBS)	places an undue emphasis technology over the value of knowledge.
Zack, 1999	Theoretical	Commentary	Explicit Knowledge; Expertise	A framework for aligning organizational and technical resources & capabilities to leverage explicit knowledge & expertise.
Koskinen, 2000	Theoretical and Survey	10 small organizations; 96 total respondents	Tacit Knowledge	Research study contributed to the understanding of the role of tacit knowledge in creating a competitive advantage in technology companies.
Nonaka, Toyama, & Konno, 2000	Theoretical	Concept Model encompassing dimensions of socialization, internalization, externalization, and in combination	Explicit and Tacit Knowledge; Knowledge Creation.	Research study focused on the organizational knowledge creation process within an organization.
Alavi & Leidner, 2001	Theoretical	Commentary	Knowledge Concepts	Review and interpretation of KM literature to

				identify areas of knowledge concepts research.
Bollinger & Smith, 2001	Theoretical	Commentary	Knowledge Management	Research study identified and examined knowledge strategies within organizations.
Gold, Molhatra, & Segars, 2001	Theoretical	Commentary	Knowledge Infrastructure Capability; Knowledge Process Capability; 7 sub-constructs	Organizational Effectiveness as a function of Knowledge Infrastructure Capability and Knowledge Process Capability.
Smith, 2001	Theoretical	Commentary	Tacit Knowledge; Explicit Knowledge	Methods to balance the use of explicit and tacit knowledge in the workplace are presented.
Stenmark, 2001	Theoretical	Commentary	Polyani's Knowledge; Tacit Knowledge	Research study expanded Polyani's tacit knowledge concept of knowledge based upon Social Cognitive Theory (SCT).
Tsoukas & Vladimirov, 2001	Theoretical; Case Study	Commentary	Individual Knowledge;	Managing organizational

2001			Organizational Knowledge; Context	knowledge entails sustaining and strengthening social practices.
Wyatt, 2001	Theoretical	Commentary	Tacit Knowledge; Explicit Knowledge	Program of knowledge codification.
Stern, 2002	Theoretical	Commentary	Plato's Theaetetus; the meaning of Knowledge	The meaning and possibility of Knowledge.
Argot, McEvily, & Reagans, 2003	Theoretical	Commentary	Knowledge Management	Integrative framework for organizing the Literature on knowledge; emerging themes identified.
Sabherwahl & Becerra-Fernandez, 2003	Theoretical; Empirical (Survey & Interviews)	159 participants; 2 rounds of interviews	Internalization; Externalization; Combination; Socialization; Individual Perceived KM Effectiveness; Group Perceived KM Effectiveness; Organization Perceived KM Effectiveness	Nine hypotheses tested; Mentors used to transfer knowledge to younger (less time in the organization) engineers. Socializing should be supplemented with formal processes supporting knowledge transfer.
Schultze &	Theoretical	Commentary	Explicit	Adaptation of

Stabell, 2004			Knowledge	Burrell & Morgan (1979) four paradigms of social and organizational inquiry.
Chan & Chau, 2005	Theoretical; Case Study	Commentary	Knowledge Categorization; Knowledge Enablers; Knowledge Strategies	Knowledge for creating core competencies and competitive advantage.
Stein, 2005	Case Study; Empirical (Survey & Interview)	101 participants	Formation; Survival & Early Growth; Late Growth & Maturity; Decline or Renewal	Techniques and mechanisms to preserve and grow organizational knowledge.
Taylor, 2005	Empirical (Interview)	25 participants	Tacit Knowledge	Critical decision interview method used to solicit and articulate tacit knowledge.
Bhardwaj & Monin, 2006	Empirical (Interview)	Stories collected from 8 Human Resource Professionals	Tacit Knowledge; Psychological Thread; Intellectual Thread; Knowledge Thread; Functional Thread; Social Thread; Cultural Thread	Tacit knowledge is a major concern for growing, knowledge-intensive organizations.
Nissen, 2006	Theoretical; Empirical	Commentary	Tacit Knowledge	The theory and study of

study

knowledge  
flow within  
organizations.

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**Knowledge Management (KM)**

*Knowledge management (KM)*, is generally defined as the ability to create, acquire, organize, share, and transfer knowledge (Wiig, 1993). von Krogh (1998) and Nissen (2006) characterized KM as identifying and leveraging collective knowledge for a competitive advantage. Of particular import to this study, KM is professed to improve both individual as well as organizational innovativeness and responsiveness (Hackbarth, 1998). Literature supporting KM, as a field of study and research discipline, is scattered and wide-ranging (Raghu & Vinze, 2007). KM – as art and practical discipline – seeks to accomplish two goals: (1) the first goal of KM in practice is efficiently manage the pool of available knowledge; and, (2) the second goal of KM in practice is to facilitate the creation of new knowledge (Hendriks & Vriens, 1999). The *focus* of the first goal of KM in practice is to get the right knowledge, to the right person or place, at the right moment in time (Nissen, 2006). This suggests that knowledge is a commodity that can be contained, manipulated, and leveraged by, as well as from electronic knowledge repositories (EKR) (Subramanian & Soh, 2009). The *focus* of the second goal of KM in practice suggests that conditions can be established as well as controlled that foster and nurture the prospects of knowledge creation (Alavi & Leidner, 2001; Hendriks & Vriens, 1999). In an organization that collaborates successfully, learning – and a learning organization – will result (Hendricks & Vriens, 1999). According to Davenport and Prusak (1998), organizations typically pursue KM initiatives with three end states in

mind: (1) make knowledge visible to the organization; (2) develop and shape a knowledge-based culture by promoting and inculcating desirable behaviors fostering and supporting knowledge sharing (vice an organizational norm of knowledge hoarding); and, (3) development of a knowledge architecture and infrastructure promoting, supporting, as well as rewarding collaboration and knowledge sharing. However, achieving these three end states, within the United States Government (USG) Intelligence Community (IC) has proven challenging (Flynn, Pottinger, & Batchelor, 2010).

As a research discipline, KM originated as an extension of the *resource-based theory of the firm* first advanced by Penrose (1959), and expanded upon by the research of Barney (1991), Conner (1991), as well as Wernerfelt (1984). Using descriptive criteria established by Coase (1937), the resource-based theory of the firm generally addresses two questions: why do firms exist at all, and what are the determinants of a firm's scale as well as scope (Holmstrom & Tirole, 1989). In the mid- to late-1990s, the KM phenomenon continued to develop emerging in strategic management literature as a "knowledge-based perspective of the firm" (Alavi & Leidner, 2001, p. 108). Although the resource-based perspective of the firm does characterize knowledge as having a significant role in firms that realize a competitive advantage, advocates of the knowledge-based viewpoint argue that the resource-based perspective does not go far enough (Grant, 1996; Kogut & Zander, 1992). Grant (1996b, 2005), Kogut and Zander (1992), as well as Nonaka and Takeuchi (1995) postulated that the resource-based theory of the firm treats knowledge as a general resource, rather than as having special characteristics facilitating an ability to distinguish between different types of knowledge-based capabilities. Of note, Alavi and Leidner (2001) suggested that technology does play

an important role in the knowledge-based view of the firm in that information systems can be used to synthesize, enhance, and enable large-scale intra- as well as inter-firm knowledge management.

KM is professed to improve both individual as well as organizational innovativeness and responsiveness (Hackbarth, 1998). Literature supporting KM, as a field of study and research discipline, is scattered and wide-ranging (Raghu & Vinze, 2007). KM – as art and practical discipline – seeks to accomplish two goals: (1) the first goal of KM in practice is efficiently manage the pool of available knowledge; and, (2) the second goal of KM in practice is to facilitate the creation of new knowledge (Hendriks & Vriens, 1999). The *focus* of the first goal of KM in practice is to get the right knowledge, to the right person or place, at the right moment in time (Nissen, 2006). The *focus* of the second goal of KM in practice suggests that conditions can be established as well as controlled that foster and nurture the prospects of knowledge creation (Alavi & Leidner, 2001; Hendriks & Vriens, 1999).

Davenport and Prusak (1998) described KM as the process of capturing, distributing, and effectively sharing knowledge with an organization. They also stated that organizations typically pursue knowledge management initiatives with three end states in mind: (1) make knowledge visible to the organization; (2) develop and shape a knowledge-based culture by promoting as well as inculcating desirable behaviors fostering and supporting knowledge sharing (vice an organizational norm of knowledge hoarding); and, (3) development of a knowledge architecture and infrastructure promoting, supporting, as well as rewarding collaboration and knowledge sharing. Schein (1985) asserted that the primary goal of knowledge management is to help organizations

not only to change, but also to change faster to keep pace with the ever-changing environment. However, achieving these three end states, within the USG IC has proven challenging (Flynn, Pottinger, & Batchelor, 2010).

Sveiby (1997) argued that knowledge sharing should be accomplished through individual collaboration within one's group, thereby efficiently transferring knowledge. Nonaka (1994) posited that individual knowledge is dependent upon the organization's ability to facilitate knowledge sharing among and between its individual members. Becerra-Fernandez (1999) suggested that effective knowledge management portends fewer mistakes in the workplace, quicker problem-solving, reduced costs, better decision making resulting in improved customer service leading to improved customer relations. Davenport and Prusak (1998) asserted that knowledge sharing is the most critical process within the discipline of knowledge management. Table 2 presents a summary of the literature related to *knowledge management* – its findings and contributions.

Table 2. Summary of Knowledge Management Literature

<b>Study</b>	<b>Methodology</b>	<b>Sample</b>	<b>Instrument / Construct</b>	<b>Main Findings or Contributions</b>
Coase, 1937	Theoretical	Commentary	KM as an integrating force; Uncertainty	KM as a mechanism for addressing uncertainty in the firm.
Penrose, 1959	Theoretical	Commentary	Firm specific knowledge; Endogenous Incentives; Exogenous Incentives	The cohesive shell of the organization is facilitated learning.
Wernerfelt, 1984	Theoretical	Commentary	Technology; Strategy	Increasing trend to define



				their KM strategies by their technologies.
Schein, 1985	Theoretical	Commentary	Culture, Organizational Structure	Established explanatory concept that cultural understanding is key to inter-group conflict resolution within the organization; emphasized the role of leadership in creating and management of organizational culture.
Bandura, 1986	Theoretical	Commentary	Social Cognitive Theory (SCT); Self-Efficacy	Research study examined cognitive, self-regulatory, and introspective processes in an individual adapting to change.
Holmstrom & Tirole, 1989	Theoretical	Commentary	Incentives; Internal Influences; External Influences	Study focused on technology acquisition as an enabler for KM at the managerial-level.
Barney, 1991	Theoretical	Commentary	Environmental Models of Competitive Advantage; Resource Based	KM system embedded in organization's informal as well formal

			Model; Internal Analysis; External Analysis	decision-making process may represent a competitive advantage.
Conner, 1991	Theoretical	Commentary	Five Schools of Thought: Neoclassical; Brain-type IO; Schumpeter; Chicago; Coase/Williamson Transaction Costs	Research focused on strategy and integration of resources (Knowledge).
Kogut & Zander, 1992	Theoretical	Commentary	Create Knowledge; Transfer Knowledge; Organizational Context; Technological Opportunities; Corporate Culture	Research focused on the creation and transfer of knowledge with an organizational context.
Wiig, 1993	Theoretical	Commentary	Governance; Staff Functions; Operational Functions; Knowledge Value	Research provides a roadmap for maximizing the organization's knowledge-related effectiveness.
Nonaka & Takeuchi, 1995	Theoretical and Structured Interviews	20 Japanese organizations; 130 managers	Knowledge Creation; Tacit and Explicit Knowledge; Innovation	Study identified two types of knowledge: explicit (recorded and can be shared with others) and implicit (derived from practical experience –

				can only be shared through analogy and metaphor).
Sveiby, 1997	Theoretical	Commentary	Tacit Knowledge; Explicit Knowledge; Knowledge Culture	Research examined means and mechanisms for knowledge transfer.
Davenport & Prusak, 1998	Empirical (Interviews)	25 Corporate Executives; 25 Case Studies	Data; Information; Knowledge	Research study contributed to the understanding of what constitutes Organizational Knowledge.
Hackbarth, 1998	Theoretical	Commentary	Organizational Learning; Organizational Memory	Contributed to the understanding the need to retain and use knowledge inherent within the organization's memory.
von Krogh, 1998	Theoretical	Commentary	Care; Knowledge; Knowledge Creation	Research focused on enabling conditions for knowledge creation and care.
Becerra-Fernandez, 1999	Theoretical	Commentary (6 Case Studies)	Knowledge capital	Study discusses the importance of KM as a competitive advantage based upon the

				experiences of six organizations.
Hendricks & Vriens, 1999	Theoretical	Commentary	Knowledge Based Systems (KBS)	KBS term in literature places an undue emphasis technology over the value of knowledge.
De Long & Fahey, 2000	Theoretical	24 Organizations	Knowledge; Organizational Culture	Research study identified four ways that Organizational Culture can directly influence knowledge creation, knowledge sharing, and use.
Alavi & Leidner, 2001	Theoretical	Commentary	Knowledge Management Concepts	Review and interpretation of KM literature.
Nissen, 2006	Theoretical; Empirical	Commentary	Tacit Knowledge	The theory and study of knowledge flow within organizations.
Raghu & Vinze, 2007	Theoretical	Commentary	Knowledge Synthesis; Operational Knowledge Core; Knowledge Storage & Retrieval; Knowledge Sharing	Contributed to research on understanding the challenges of KM within a business context.

Subramanian & Soh, 2009	Empirical	Single organization; 180 respondents	Inducements; Opportunity	Research contributed to an understanding of user motivation for knowledge sharing.
Flynn, Pottinger, & Batchelor	Theoretical	Commentary	Tacit Knowledge; Explicit Knowledge; Knowledge Transfer; Knowledge Management; Decision Support	Contributes to an understanding of effective Knowledge analysis and knowledge transfer in support of effective decision-making.

### **Knowledge Management Systems (KMS)**

Alavi and Leidner (1999) defined KMS as “an emerging line of systems (that) targets professional and managerial activities by focusing on creating, gathering, organizing, and disseminating an organization’s ‘knowledge’ as opposed to ‘information’ or ‘data’” (p. 3). Literature indicates that two KMS models have emerged. The *network model* that uses communications technologies to connect knowledge workers, while the *repository model* uses information technologies to capture, store, organize, and disseminate explicit organizational knowledge (Alavi & Leidner, 1999; Fahey & Prusak, 1998). Alavi and Leidner (1999), as well as Marwick (2001) cited the importance of information technologies as a means by which users are provided access to relevant information while simultaneously capturing as much information as feasible -

contributing to the organization's body of knowledge. McDermott (1999) and Zack (1999) observed that both social and technical barriers must be overcome to reap the benefits of KMS. Cross and Baird (2000), McDermott (1999), as well as Yap and Bjoern (1998) argued, however, that sophisticated KMS technology – while significant – is no guarantee of success in KM initiatives. Ruppel and Harrington (2001) asserted that this condition is true because social interactions appear to be contributory to ensuring knowledge sharing success. To be credible, KMS research and development should preserve as well as build upon the significant literature that exists in different but related fields (Stein & Zwass, 1995; Kühn & Abecker, 1997). Table 3 presents a summary of the literature related to *knowledge management systems* – its findings and contributions.

Table 3. Summary of Knowledge Management Systems (KMS) Literature

Study	Methodology	Sample	Instrument / Construct	Main Findings or Contributions
Stein & Zwass, 1995	Theoretical	Commentary	Layer 1 (Integrative Subsystem; Adaptive Subsystem; Goal Attainment Subsystem; Pattern Maintenance Subsystem); Layer 2 (Mnemonic Functions)	Proposed an Organizational Management Information System (OMIS) model rooted in the construct Organizational Effectiveness; Core competence of an organization rooted in the experiential knowledge of its members.
Davenport & Prusak, 1997	Theoretical	Commentary	Information Strategy; Information Politics; Information	Research focused on the behavioral/human side of information and

			Behavior & Culture; Information Staff; Information Management Processes	knowledge sharing rather than the IS technology supporting it.
Kühn & Abecker, 1997	Empirical (Case Study)	3 case studies	Communication; Coordination; Cooperation	Research focused on the development of an Organizational Memory Information System (OMIS); purpose – get the right information to the right person.
Fahey & Prusak, 1998	Empirical	100 organizations	11 Deadly Sins of KM	Identified common ‘errors’ impacting organizational success with the introduction and use of KM practices and solutions within the business enterprise.
Ruggles, 1998	Empirical	431 organizations	Generating New Knowledge; Accessing Valuable Knowledge from Outside Sources; Using Accessible Knowledge in Decision Making; Embedding Knowledge in Processes,	Examined the implementation of IS to facilitate the capture and sharing of organizational knowledge.

			Products and/or Services; Representing Knowledge in Documents, Databases, & Software; Facilitating Knowledge Growth through Culture and Incentives; Transferring Existing Knowledge to Other Parts of the Organization; Measuring the Value of Knowledge Assets and/or Impact of KM	
O'Dell & Grayson, 1998	Theoretical	Commentary	Internal Benchmarking; Best Practices; Knowledge Transfer	Contributed to understanding how organizations become learning organizations; cultures of knowledge sharing and innovation.
Yap & Bjoern-Andersen, 1998	Theoretical	Commentary	Virtual Reality; 3D Technology	Argued that organizational learning evolves to a higher level only when KM is radically improved with the aid of IT facilitating the preservation of expert knowledge



				using artificial intelligence.
Alavi & Leidner, 1999	Empirical	109 participants	KM Perspectives: Information-based; Technology-based; Culture-based	Study determined effective KMS is more than technology encompassing broad cultural and organizational issues; organizational as well as behavioral change management are the critical factors determining success.
McDermott, 1999	Theoretical	Commentary	Critical Thinking (Human Systems); Information Systems (IS); Learning Organizations	Introduced four key challenges to knowledge sharing success within organizations: technical; social; management; personal.
Zack, 1999	Theoretical	Commentary	Knowledge Repository; Knowledge Refinery; Organization Roles to Refine Knowledge; Information Technologies	Research provided a framework for configuring an organization's capabilities and resources to support and leverage knowledge.
Cross & Baird, 2000	Theoretical	Commentary	Individual Memory; Personal Relationships; Databases;	Research introduced five forms of knowledge retention

			Work Processes and Support Centers; Products and Services.	supporting knowledge sharing.
Alavi & Leidner, 2001	Theoretical	Commentary	Knowledge Creation; Knowledge Storage & Retrieval; Knowledge Transfer; Knowledge Application	Research presented a discussion of knowledge, KM, and KMS based upon a review, analysis, interpretation, and synthesis of relevant literature.
Marwick, 2001	Theoretical	Commentary	Socialization; Externalization; Internalization; Combination	Provided an overview of technologies that are applicable to KM; Assessed actual and/or potential contributions to knowledge creation and knowledge sharing within the organization.
Ruppel & Harrington, 2001	Empirical (Survey)	44 respondents	Developmental Culture; Rational Culture; Hierarchical Culture; Group Culture; Ethical Culture; Intranets	Research contributed to body of knowledge on IS innovation, KM, and intranets supporting knowledge sharing.

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### Inducements to Contribute Knowledge to a KMS

### *Reward*

Yao, Kam, and Chan (2007) suggested that a lack of incentives is a major barrier to knowledge sharing across cultures. Hansen, Nohria, and Tierney (1999), Liebowitz (2003), as well as Nelson, Sabatier, and Nelson (2006) contended that incentives – encompassing recognition and rewards as interventions – serve to facilitate knowledge sharing as a means to build a supportive culture. Based upon *social exchange* and *social capital theories*, organizational awards like promotions, bonuses, and salary increases have shown to be *positively related to the frequency of knowledge contribution to a KMS*, more so when the knowledge workers identify with their organization (Kankanhalli et al., 2005; MacInnis, Moorman, & Jaworski, 1991). Additionally, those knowledge workers who perceive a greater likelihood of receiving incentives through the use and sharing of the KMS, are more likely to report its content as being useful (Cabrera, Collins, & Salgado, 2006; Kulkarni, Ravindran, & Freeze, 2007). Similarly, Kim and Lee (2006) found that organizations using performance-based pay systems were more likely to have employees who make it a practice to contribute to knowledge sharing and KMS.

Notwithstanding the anticipated positive influence incentives would have on knowledge sharing, the empirical results of studies examining the effects of extrinsic rewards has been mixed. Bock and Kim (2002), as well as Bock, Zmud, Kim, and Lee (2005) determined that extrinsic rewards had a negative effect on knowledge workers attitudes toward knowledge sharing and KMS. Studies conducted by Kwok and Gao (2005), Lin (2007a), as well as Lin (2007b) discovered that no relationship existed between extrinsic motivations and knowledge sharing or attitudes toward knowledge

sharing. Chang, Yeh, and Yeh (2007) demonstrated that outcome-based rewards, as well as awards for effort, did little to foster knowledge sharing among team members.

Literature reflects that different types of rewards (rather than the presence or absence of same) influence knowledge sharing. Weiss (1999) emphasized a need to better align incentives and knowledge sharing. Ferrin and Dirks (2003) found that a reward system based on cooperation among team members had a positive influence on knowledge sharing, whereas a competition based system had the opposite effect. Quigley, Tesluk, Locke, and Bartol (2007), as well as Taylor (2006) argued that group-based incentives had a greater positive influence on knowledge sharing than individual-based incentives. Siemsen, Balasubramanian, and Roth (2007) determined that group- and individual-based incentives for knowledge sharing were interrelated; this inter-relatedness growing stronger as individual-based rewards were increased. Table 4 presents a summary of the literature related to *reward as an inducement* for analysts to contribute to knowledge to a KMS – its findings and contributions.

Table 4. Summary of Literature – Reward as an Inducement for Analysts to Contribute Knowledge to a KMS

<b>Study</b>	<b>Methodology</b>	<b>Sample</b>	<b>Instrument / Construct</b>	<b>Main Findings or Contributions</b>
MacInnis, Moorman, & Jaworski, 1991	Theoretical	Commentary	Processing Motivation; Processing Opportunity; Processing Ability	Organized existing literature on the effects of motivation, opportunity, and ability; study suggested that trade-offs between motivation and opportunity.

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Hansen, Nohria, & Tierney, 1999	Theoretical	Commentary	Codification Strategy; Personalization Strategy	Findings showed individuals need incentives to participate in and support the knowledge sharing process. Each strategy requires a different incentives approach in support of the organization's competitive strategy.
Weiss, 1999	Empirical (Interviews)	128 participants	Knowledge Collection; Knowledge Connection	Introduced a framework introducing core social processes of knowledge collection & connection; addressed the importance of rewards & other incentives as determinants for knowledge sharing.
Ba, Stallaert, & Whinston, 2001	Theoretical	Commentary	Organizational Incentive Structure; User Behavior; Behavioral Theories and Paradigms; Organizational Objectives; Information Systems Design	Researchers suggested that for an information system to be correctly designed, it should include the right incentives so that no user can

			Objectives; Group Support Tools; Outcome	cheat the system or benefit from distorting information.
H. Hall, 2001	Theoretical	Commentary	Straightforward Rewards Systems; Organizational Factors	Researcher drew on published studies to present individual as well as group incentives for knowledge sharing.
Bock & Kim, 2002	Empirical (Survey)	467 participants from 4 organizations	Expected Rewards; Expected Contributions; Expected Associations; Attitude Toward Knowledge Sharing; Behavioral Intention to Share Knowledge; Knowledge Sharing Behavior; Level of IT Usage	Argued that counter to Socio- Economic Theory, a person's attitude toward knowledge sharing is negatively related to expected rewards; expected rewards discourage the development of a positive attitude toward knowledge sharing.
May, Korczynski, & Frenkel, 2002	Empirical (Interview & Survey)	134 knowledge workers from 2 corporations	Occupational Commitment; Organizational Commitment	Research determined that extrinsic rewards were not a motivator for knowledge workers.

Ferrin & Dirks, 2003	Empirical (Survey)	224 business students	Cooperative Rewards; Competitive Rewards; Initial Trust Condition; Performance; Trust	Researchers determined that rewards influence trust and knowledge sharing; argued further that rewards are a useful tool for managers wishing to change employee perceptions, beliefs, and behaviors.
Liebowitz, 2003	Empirical (Case Study)	1 organization	KM Strategy; KM Plan	Argued for the development and implementation of an incentive (rewards) program to motivate employees to share knowledge.
Bock, Zmud, Kim, & Lee, 2005	Empirical (Survey)	154 respondents from 27 organizations	Attitude Toward Knowledge Sharing; Subjective Norm; Organizational Climate; Intention to Share Knowledge	Added to an understanding of the factors underlying employee attitude toward intentions regarding knowledge sharing behaviors; effective knowledge sharing cannot

				be forced or mandated.
Kankanhalli, Tan, & Wei, 2005	Empirical (Survey & Interview)	17 KM executives (Interviews); 150 respondents (Survey)	Loss of Knowledge Power; Codification Effort; Organizational Reward; Image; Reciprocity; Knowledge Self-Efficacy; Enjoyment in Helping Others; Generalized Trust; Pro-Sharing Norms; Identification; Usage	Study determined in organizations where knowledge contribution to a KMS is voluntary, employees shared only that content that individual determined would not cause them to be of less value to the organization.
Kwok & Gao, 2005	Empirical (Survey)	75 undergraduate information systems students	Extrinsic Motivation; Absorptive Capacity; Channel; Attitude; Richness	Study revealed that people have little regards for what rewards they can attain through knowledge sharing.
Cabrera, Collins, & Salgado, 2006	Empirical (Survey)	372 participants	Person; Environment; System	Findings indicated that rewards had a moderate effect on knowledge sharing; rewards do not need to be monetary. HR may need to align job descriptions, performance appraisals as



				wells as career policies to effect knowledge sharing.
Kim & Lee, 2006	Empirical (Survey)	322 participants from the private and public sector	Organizational Culture; Organization Structure; Information Technology; Employee Knowledge Sharing Capabilities	Findings showed that for public sector employees, performance-based rewards systems were positively associated with high levels of knowledge sharing.
Nelson, Sabatier, & Nelson, 2006	Empirical (Case Study; Survey; & Interview)	52 participants	Organizational Citizenship; Impression Management; Knowledge Sharing Culture; Knowledge Sharing Behavior	Findings determined that employees show an indifference to rewards as factor in improved knowledge sharing within the organization.
Taylor, 2006	Empirical	52 accounting students	Incentive Conditions; Knowledge Sharing	Findings showed that group-based incentives positively influences knowledge sharing; profit sharing and team rewards represent group-based incentives.

Chang, Yeh, & Yeh, 2007	Empirical	233 respondents	Joint Reward System; Knowledge Sharing; NPD Performance	Empirical results showed that reward, as an incentive has no significant impact on knowledge sharing between organizational members.
Kulkarni, Ravindran, & Freeze, 2007	Empirical (Survey)	150 participants	Explicit Knowledge Use; Perceived Usefulness of Knowledge Sharing; User Satisfaction; Knowledge Content Quality; KM System; KM System Quality; Organizational Support	Findings showed that top management must be organizational knowledge champions; should institute policies and procedures for rewards, recognition, as well as incentives to promote knowledge sharing and practices.
Lin, 2007a	Empirical (Survey)	172 participants	Extrinsic Motivation; Intrinsic Motivation; Attitudes Toward Knowledge Sharing; Knowledge Sharing Intentions	Research showed that employee attitudes and behaviors toward knowledge sharing were not significantly influenced by organizational rewards.
Lin, 2007b	Empirical	172 participants	Individual	Research

	(Survey)		Factors; Organizational Factors; Technology Factors; Knowledge Donating; Knowledge Collecting; Firm Innovation Capability	verified organizational rewards are not significantly related to knowledge sharing processes; rewards for knowledge sharing but are not a fundamental force in forming knowledge sharing behaviors.
Quigley, Tesluk, Locke, & Bartol, 2007	Empirical (Simulation)	120 participants	Incentive Condition; Norms; Knowledge Shared; Knowledge Provider; Self- Efficacy; Trust; Self-Set Goal; Knowledge Goal; Performance; Task Ability	Findings determined that incentives (rewards) alone had a weak influence on knowledge sharing.
Siemsen, Balasubramian, & Roth, 2007	Empirical (Survey)	4 service and manufacturing firms; response rates 11-54%	Knowledge Linkages; Help Linkages; Outcome Linkages	Research contradicted literature suggesting individual rewards detract from group cooperation (Deming, 1983); optimal individual incentives are positive and

				optimal group incentives are negative.
Yao, Kam, & Chan, 2007	Empirical (Survey; Interviews)	40 respondents	Culture; Attitudes; Barriers to KM	Findings suggested that without rewards and other incentives, knowledge sharing will not occur between employees within the organization.
Subramanian & Soh, 2009	Empirical	Single organization; 180 respondents	Inducements; Opportunity	Research argued that irrespective of an employee's position within the organization, an individual would be inclined to contribute knowledge with the expectation that he/she will be rewarded through knowledge sharing within the organization.
Cryder, London, Volpp, & Loewenstein, 2010	Empirical (Survey)	Two experiments: (1) 242 participants; (2) 1218 participants	Education; Income; Reward	Research argued that participation compensation level dictated both the interest level

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and the willingness of an individual to participate in an experiment (including high risk).

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### *Centrality*

Centrality has been described as the degree to which one believes s/he can increase in degree and closeness to others within the organization (establishing oneself in a position of influence) because of knowledge contributions to the organization (Astley & Sachdeva, 1984; Yli-Renko, Autio, & Sapienza, 2001). Employees may choose to engage in knowledge sharing as a means to develop personal relationships with peers or, to simply manage their impression on others (Bolino, 1999). Based on personal associations, different intentions may influence with whom knowledge is shared. Employees may be more likely to use a KMS to share knowledge because they have a greater motivation to impress their supervisors (Kelley, 1967). If a knowledge provider is conducting knowledge sharing for the expressed purpose of influencing management policy or organizational politics, then the knowledge provider is likely to be viewed unfavorably by others who will be less likely to reciprocate in knowledge sharing activities (Wofford, 1971).

Centrality and power are inextricably linked (Subramanian & Soh, 2009). Centrality is a function of an employee's connectedness (position of influence) to other sources of power within the organization: people, information, and other resources (Pfeffer, 1981). A change in an employee's connectedness to these sources of power will,

by necessity, dictate a change in the employee's centrality (position of influence) within the organization (Burkhardt & Brass, 1990). An organization faced with uncertainty, will inevitably fuel the desire of its knowledge workers to reduce their level of personal uncertainty – triggering major shifts in power and centrality across the face of the organization (Burkhardt & Brass, 1990). Hickson, Hinings, Lee, Schenk and Pennings (1971) demonstrated that employees who have the requisite knowledge to reduce uncertainty, through knowledge sharing within an organizational setting, will be looked to as a subject matter experts. These subject matter experts will become key figures in organizational problem resolution, thereby increasing their centrality and power (Tushman & Romanelli, 1983). Once ensconced in a position of power and centrality, these subject matters will work diligently to extend their power and centrality advantage (Tushman & Romanelli, 1983). Table 5 presents a summary of the literature related to *centrality as an inducement* for Analysts to contribute knowledge to a KMS – its findings and contributions.

Table 5. Summary of Literature – Centrality as an Inducement for Analysts to Contribute Knowledge to a KMS.

<b>Study</b>	<b>Methodology</b>	<b>Sample</b>	<b>Instrument / Construct</b>	<b>Main Findings or Contributions</b>
Kelley, 1967	Theoretical	Commentary	Distinctiveness; Consistency Over Time; Consistency Over Modality; Consensus	Contributed the Covariation Model arguing an individual's action can be attributed to a (internal) characteristic of the person within the environment (external).

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Hickson, Hinings, Lee, Schneck, & Pennings, 1971	Theoretical	Commentary	Power; Uncertainty; Coping with Uncertainty; Substitutability; Centrality	Researches argued: (1) the higher the pervasiveness of the workflows of a subunit, the greater the subunit's power within the scope of the total organization; (2) the higher the immediacy of the workflows of the subunit, the greater its power within the scope of the total organization.
Wofford, 1971	Empirical (Survey)	177 respondents	Managerial Behavior Dimensions; Situational Factors Variables	Research defined the Personal Enhancement Manager – who uses his/her authority as the primary means for influencing subordinates.
Pfeffer, 1981	Theoretical	Commentary	Political Strategies; Political Tactics	Research determined that individuals responsible for the critical performance task within the organization have a natural advantage in

				developing and exercising control.
Tushman & Romanelli, 1983	Empirical	225 participants	Formal Status; Informal Communication Role; Influence in Decision Making; Task Requirements	Research determined that Formal position (Status) dominates perceived influence in decision making; moreover, formal status is the most powerful predictor of influence across a task area.
Astley & Sachdeva, 1984	Theoretical	Commentary	Hierarchical Authority; Resource Control; Network Centrality	Recognized that coping with uncertainty could be mitigated by pervasiveness – the extent to which one position within the organization is interconnected with others.
Burkhardt & Brass, 1990	Empirical (Longitudinal Study)	81 participants (sample size of over the four reporting time periods)	Power; Centrality	Study determined that employees increase their power and centrality following the introduction of IS technology; early adopters



				increase their power and centrality to a greater degree than later adopters.
Bolino, 1999	Theoretical	Commentary	Impression Management Motives; Traditional Motives; Organizational Citizenship Behavior; Organization/Work Group Effectiveness; Image of Good Organizational Citizen; Audience Perception of Motive	Research focused on providing a framework measuring impression management: tactics employees use to enhance their images at work; such actions may be self-serving rather than acting selflessly for the benefit of their organization.
Yli-Renko, Autio, & Sapienza, 2001	Empirical (Survey)	225 responses from 180 Technology Firms	Social Interaction; Relationship Quality; Customer Network Ties; New Product Development; Technological Distinctiveness; Sales Costs; Knowledge Acquisition	Research results indicated a positive correlation between social interaction and network ties with respect to knowledge acquisition.
Subramanian & Soh, 2009	Empirical	Single organization; 180 respondents	Inducements; Opportunity	Research argued that irrespective of an employee's position within the

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organization,  
 an individual  
 would be  
 inclined to  
 contribute  
 knowledge  
 with the  
 expectation  
 that he/she will  
 improve his or  
 her own  
 centrality  
 within the  
 organization.

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*Power*

A definitive understanding of the concept of power remains elusive (Bachrach & Baratz, 1962). Kankanhalli, Tan, & Wei (2005) described power as the ability or the right to control people and/or things. When exercised as a source of individual power and superiority, Knowledge can be an inhibitor (Gupta & Govindarajan, 2000; Mulder, 1971; Orlikowski, 1993). Husted and Machilova (2002) determined that knowledge sharing could be adversely affected in situations wherein employees realize that by not sharing the knowledge they can favorably influence their rewards system (e.g., promotion, pay, extended job assignments, & employment retention). As shown by Kim and Mauborgne (1998), as well as Szulanski (1996), knowledge sharing leading to the promotion of the common good for all employees as well as the organization, becomes a disincentive, because the distinctiveness of each employee is lost. Additionally, these concerns may be exacerbated by the use of KMS because its contributions are recorded and are generally made available to all users even those who have not made a contribution to the system (Fehr, Holger, & Wilkening, 2013; Wasko & Faraj, 2000).

Astley and Sachdeva (1984), Liao (2008) as well as Renzl (2008) examined the need to provide incentives to motivate knowledge workers to share their knowledge, but also suggested the need for further research knowledge sharing from a power perspective. Liao (2008) and Renzl (2008) also posited that as knowledge workers may refrain from knowledge sharing because of the fear of losing power, these same knowledge workers are also capable of increasing their expertise and referent power through knowledge sharing. Table 6 presents a summary of the literature related to *power as an inducement* for Analysts to contribute knowledge to a KMS – its findings and contributions.

Table 6. Summary of Literature – Power as an Inducement for Analysts to Contribute Knowledge to a KMS.

<b>Study</b>	<b>Methodology</b>	<b>Sample</b>	<b>Instrument / Construct</b>	<b>Main Findings or Contributions</b>
Bachrach & Baratz, 1962	Theoretical	Commentary	Mobilization of Bias; Dynamics of Non-decision making	Offered a fresh approach to understanding the concept of two faces of power.
Orlikowski, 1993	Empirical (Interview)	91 participants	Cognitive Organizational Elements; Structural Organizational Elements	Findings suggested that people do not understand nor appreciate the value of collaborative technologies (i.e., shared effort, cooperation, collaboration); indeed it is counter-culture to an organization's structural

				properties (i.e., competitive and individualistic).
Doyle, 1971	Empirical (Survey)	27 Experimental Groups	Knows How to Do His Job; Gets Along Well with His Faculty; Shows More Loyalty to His Faculty than Superiors; Is Enthusiastic About His Work	Research showed organizations with Leaders who have high achieved status (Power) were less likely to generate new ideas, more likely to have new ideas ignored, as well as less knowledge sharing.
Mulder, 1971	Empirical	Small Groups	Expert Power; Participation	Research determined that actual exertion of influence lead to a stronger motivation for further exertion of influence.
Astley & Sachdeva, 1984	Theoretical	Commentary	Hierarchical Authority; Resource Control; Network Centrality	Argued that power can be exercised by the pairwise interaction of three interconnected means: hierarchical authority; resource control; network centrality.
Szulanski, 1996	Empirical	271	Stickiness;	Study revealed

(Survey)	Observations of 122 Best Business Practice Knowledge Transfers	Causal Ambiguity; Unproven Knowledge; Source Lacks Motivation; Source; Recipient Lacks Motivation; Recipient Lacks Absorptive Capacity; Barren Organizational Context; Arduous Relationship; Recipient Lacks Retentive Capacity; Barren Organizational Context; Arduous Relationship	three barriers to knowledge sharing: Absorptive Capacity which is a function of the recipient's knowledge endowment prior to knowledge transfer; Causal Ambiguity which is a function of the recipient's depth of knowledge or irreducible uncertainty of cause-effect relationships; and, the Arduous Relationship which is a function of the quality of the relationship with the recipient affecting the recipient's ability to acquire knowledge when needed. Incentives intended to mitigate stickiness appear to be inadequate or misled.
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Mauborgne, 1998			Justice; Strategic Decision Making; Team Performance; Knowledge Sharing	theory labeled Intellectual and Emotional Recognition Theory. Research argued that a violation of fair process in the strategic decision making of teams will portend the emotional anger and intellectual discontent of the team members.
Gupta & Govindarajan, 2000	Theoretical	Commentary	Creating & Acquiring New Knowledge; Sharing & Mobilizing Knowledge	Researchers argued that organizations only maximize knowledge sharing when the company treats knowledge as a resource that cannot be hoarded by any individual or business unit.
Wasko & Faraj, 2000	Empirical	604 participants	Individual Motivations; Structural Capital; Cognitive Capital; Relational Capital; Knowledge Contribution	Results indicated that a significant factor driving individual participation is the perception that collaboration improves an individual's

				stature and/or reputation.
Husted & Machilova, 2002	Theoretical	Commentary	Knowledge Transmitter Behavior; Knowledge Recipient Behavior; Transmitter & Receiver Shared Understanding of the Content of the Knowledge	Researchers argued that knowledge sharing is dependent on the willingness of the knowledge possessor to indicate possession of the knowledge as well as his/her willingness to share it.
Kankanhalli, Tan, & Wei, 2005	Empirical (Survey & Interview)	17 KM executives (Interviews); 150 respondents (Survey)	Loss of Knowledge Power; Codification Effort; Organizational Reward; Image; Reciprocity; Knowledge Self-Efficacy; Enjoyment in Helping Others; Generalized Trust; Pro-Sharing Norms; Identification; Usage	Study determined in organizations where knowledge contribution to a KMS is voluntary, employees shared only that content that individual determined would not cause them to be of less value to the organization.
Liao, 2008	Empirical	105 R&D employees	Reward Power; Coercive Power; Legitimate Power; Expert Power; Reference	Study assessed the impact of a manager's social powers as it relates to knowledge sharing

			Power; Knowledge Sharing Behavior	behavior.
Renzl, 2008	Empirical (Interview & Survey)	Interviews – (1) Utility Sector Company – 8 participants; (2) Software Consulting Company – 7 participants; Survey – (1) Utility Sector Company – 133 participants; (2) Software Consulting Company – 68 participants	Documentation of Knowledge; Knowledge Sharing with Teams; Knowledge Sharing Between Teams; Fear of Losing One’s Unique Value; Trust in Management	Research documented that fear of losing ones’ unique value plays a mediating role between role between trust in management and knowledge sharing.
Subramanian & Soh, 2009	Empirical	Single organization; 180 respondents	Inducements; Opportunity	Research contributed to an understanding of user motivation for knowledge sharing.
Fehr, Holger, & Wilkening, 2013	Empirical	504 participants from Zurich University	Principal Control; Agent Control	Study showed that in a Principal and Agent relationship, the Agent will underprovide supporting effort despite incentives to the contrary.



### *Trust*

Literature generally showed a *positive*, interpersonal trust-knowledge sharing relationship. *Trust*, as a concept, does not have a universally accepted definition (Barber, 1983; Das & Teng, 2004; Kee & Knox, 1970, McKnight & Chervany, 2002; Rousseau, Sitkin, Burt, & Camerer, 1998). For the purposes of this study, *trust* is defined as a person's willingness to depend on another individual's actions that involve opportunism (Holzner, 1973; Williams, 2001; Zand, 1972). *Trusting* an individual means "the probability that he (or she) will perform an action that is beneficial or at least not detrimental to us is high enough for us to consider engaging in some form of cooperation with him (or her)" (Gambetta, 1988, p. 217). From literature, two streams of conceptualization concerning a definition of trust emerge. The first centers on *trust as an expectation* of an interacting partner (Barber, 1983; Koller, 1988; Luhmann, 1979; Rotter, 1967). The second focuses on *associating trust with an acceptance of and exposure to vulnerability* (Doney, Cannon, & Mullen, 1998; Mayer, Davis, & Schooman, 1995; Rousseau et al., 1998; Zand, 1972).

Søndergaard, Kerr, and Clegg (2007) showed that trust could be a double-edged sword. Trust is the key enabler in knowledge sharing between individuals in an organization (Bartol & Srivastava, 2002, Das & Teng, 2001; von Krogh, Roos, & Kleine, 1998). Unqualified or unjustified trust in another may influence a user's decision to refrain from questioning the usefulness of the knowledge, or the context in which it is applied, leading (potentially) to the misapplication or misuse of the knowledge (Søndergaard, Kerr, & Clegg, 2007). Studies conducted by Mooradian, Renzl, and

Martzler (2006), as well as by Renzl (2008) centered on employee's trust in management as opposed to employee's trust in other employees yielded mixed results.

Baier (1986) as well as Hosmer (1995) found that an organization's reputation stems from its trustworthy behaviors. Herbig, Milewicz, and Golden (1994) argued further that an organization's repeated failures to deliver on its intentions would eventually result in a decline of the organization's reputation. Smeltzer (1997) determined that a *positive* organizational standing results in a more open and trusting relationship, whereas the opposite is true if the organization's reputation is *negative*.

Trust is a function of trustworthiness, based on referrals or ratings from members in a community (Jøsang, Ismail, & Boyd, 2007). Trust is also an indication of an individual's (or collectively an organization's) credibility, which is the result of a comparison between what the individual (or organization) promises and what s/he (it) actually delivers (Casalo, Flavian, & Guinaliu, 2007; Jones & George, 1998; Knights, Noble, Vurdubakis, & Willmott, 2001; Xu, Kim, & Kankanhalli, 2010). Viewed strictly from an individual level, Jones and George (1998) looked at trust as a function of the psychology of the person. The individual's psychological state implies that people vary in terms of who, when, and how much one is willing to trust. According to Tyler and Kramer (1996), trust is based on an individual's "estimation of the probability that those trusted will reciprocate the trust" (p. 10). Tyler and Kramer (1996) further suggested that such a viewpoint explains "why a person trusts and why trust declines or increases" (p. 5).

Some people are more trusting than others (Lewicki, McAllister, & Bies, 1998; Mayer, Davis, & Schoorman, 1995; McEvily, Perrone, & Zaheer, 2003). A substantial

variation in the propensity and density of trust one is willing to extend to another occurs because of the systemic nature of human personalities (Das & Teng, 2004; Luhmann, 1979; Rotter, 1980). This readiness to trust varies not only from one person to another, and from situation to situation (Worchel, 1979; Powley, 2009). So one can ask, ‘Do we trust because we are faced with risk? Or do we take risks because we trust?’ Koller (1988) as well as Lewis and Weigert (1985) asserted that the risk determines the level of trust. Mayer, Davis, and Schoorman (1995) presupposed that trust is an antecedent to risk-taking. An individual’s level of trust in his/her partner is positively related to the perceived risks in any given situation (Mayer, Davis, & Schoorman, 1995). Kee and Knox (1970) determined that even when risks were negligible, trust was necessary as long as betrayal was a possibility. Moreover, risk is critical in the building of trust since trust would not be necessary if actions could be pursued with absolute certainty (Lewis & Wiegert, 1985). Table 7 presents a summary of the literature related to *trust as an influence on an Analysts willingness* to contribute knowledge to a KMS – its findings and contributions.

Table 7. Summary of Literature – Trust as an Influence on an Analyst’s Willingness to Contribute Knowledge to a KMS.

<b>Study</b>	<b>Methodology</b>	<b>Sample</b>	<b>Instrument / Construct</b>	<b>Main Findings or Contributions</b>
Rotter, 1967	Empirical (Survey)	547 respondents (college students)	Ordinal Position; Religion; Religious Differences; Socioeconomic Level	Trust is significantly related to family position; religion; religion difference with parents; socioeconomic level.

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Kee & Knox, 1970	Theoretical	Commentary	Structural and Situational Factors; Previous Experience; Dispositional Factors; Perceptions of Motives and/or Competence; Subjective Trust or Suspicion; Behavioral Trust or Suspicion	There is little agreement on the nature and meaning of trust and suspicion; proposed two components for each – (1) the observable choice behavior; (2) a subjective state underlying the manifest choice behavior.
Zand, 1972	Empirical (Survey; Interview)	64 participants in 16 problem- solving groups	Trust; Control; Information; Influence	Findings indicated trust is a behavior that conveys appropriate information; permits mutuality of influence; encourages individual self- control; and, avoids abuse of the vulnerability of others.
Luhmann, 1979	Theoretical	Commentary	Trust; Power	Two works (i.e., Trust and Power) presented in one volume. Trust is an illusion and cannot be built in an environment of chaos – where generalizations cannot be

				drawn. Power is a communications medium establishing control over contingencies – the “yes” and “no” of human relations.
Worchel, 1979	Theoretical	Commentary	Motivational Orientation; Communication; Power; Payoffs	Results show a cooperative motivational orientation coupled with the communications elements of expectation, intention, retaliation, and absolution influence the building of mutual trust.
Rotter, 1980	Theoretical	Commentary	Interpersonal Trust; Pro-social Behavior; Gullibility	Research asserted people who trust are less likely to cheat, lie, or steal; high truster less likely to be unhappy, conflicted or maladjusted.
Barber, 1983	Theoretical	Commentary	Trust; Order; Societal Change	Provided theoretical clarification of trust as a concept; provided insights relative

				to how trust grows, declines, and operates within the context of social relationships.
Lewis & Weigert, 1985	Theoretical	Commentary	Cognitive; Affective; Behavioral	Examines Trust as a sociological concept.
Koller, 1988	Empirical (Questionnaire)	Two Studies: Study 1 – 28 participants; Study 2 – 29 participants	Trust; Risk; Degree of Trust	Introduced Control Theory – the motivation an individual has to control his/her environment; individuals wish to influence positive outcomes while minimizing the appearance of being associated with negative outcomes.
Herbig, Milewicz, & Golden, 1994	Empirical	24 Graduate Student Teams	Reputation; Credibility	Study showed that reputation and credibility are built upon credible transactions; major warning – both reputation and credibility are fragile – may be lost or destroyed.
Hosmer, 1995	Theoretical	Commentary	Individual Expectations; Interpersonal Relations; Economic	Research needs to address trust as the critical link between the moral duty of

			Transactions; Social Structures	managers and organizational performance.
Mayer, Davis, & Schooman, 1995	Theoretical	Commentary	Ability; Benevolence; Integrity; Trust; Truster's Propensity; Perceived Risk; Risk Taking in Relationship; Outcomes	Model proposed considers characteristics of the truster as well as the trustee; trust is a willingness to be vulnerable.
Tyler & Kramer, 1995	Theoretical	Commentary	Trust; Distrust	Research showed that individuals are motivated to maximize personal gains and minimize personal losses in social interaction; individuals act from a self- interest and perspective.
Noteboom, Berger, & Noorderhaven, 1997	Empirical (Survey)	97 participants	Size of Loss; Profitability of Loss	Study determined that relational risk (trust) had two dimensions: size of loss and profitability of loss; each has markedly different causes.
Smeltzer, 1997	Empirical (Interview)	19 purchasing managers	Trust; Identity; Image; Reputation	Study identified 6 trust-based research and managerial issues: Non- calculative

				trust; Future Oriented concerns; Individual vs. Organizational interests; Dynamic attribute; Incomplete Information; and, Limited span.
Doney, Cannon, & Mullen, 1998			National Culture; Norms Values and Underlying Behavioral Assumptions; Cognitive Processes; Other Factors Affecting the Trust Development Process; Non-cognitive Processes; Trust	Proposed a model of the National Culture and the Development of Trust; developed a framework of trust building processes that suggest five different routes trusters may take to developing trust in/with another.
Gambetta, 1998	Theoretical	Commentary	Cooperation; Competition; Motives; Beliefs; Ignorance or Uncertainty; Coercion; Constraint; Contracts or Promises	Trust may increase through use; the concession of Trust is that sustained distrust can only lead to more distrust. Asking too much of trust is as ill-advised as asking too little.
Jones & George, 1998	Theoretical	Commentary	Conditional; Unconditional;	Research examined why



			Values; Attitudes; Moods and Emotions	organizational cooperation does and does not occur; a function of Conditional or Unconditional trust as the result of the interactions between values, attitudes, moods and emotions.
Rousseau, Sitkin, Burt, & Camerer, 1998	Theoretical	Commentary	Calculative Trust; Institutional Trust; Relational Trust	Research showed considerable overlap and synthesis among the disciplines in literature focused on Trust.
Zack, 1999	Theoretical	Commentary	4 Primary KM Contexts influence organizational performance: Strategic Context; Knowledge Context; Organizational Context; Technology Context	Introduced discussion on KM Architecture – configuring an organization’s capabilities and resources to leverage its codified knowledge.
Athanassiou & Nigh, 2000	Empirical (Questionnaire)	39 MNCs	Personal Experience; Overseas Face-to- Face Meeting; Extent; Internal Mode; Upstream Interdependence; Team Size; Team	Findings indicated a high- level of sharing between top management members; a consequence of a socialization

			Tenure; Company Size	process (trust building).
Scott, 2000	Empirical (Semi-structured Interviews)	69 participants	Inter-organizational Learning; Information Technology; Inter-organizational Trust; Inter-organizational Collaboration	Findings indicated that effective intra-organizational collaboration requires trust. A lack of trust is a barrier to inter-organizational learning.
Clarke & Rollo, 2001	Theoretical	Commentary	Knowledge-based Economy; Learning Organizations	Argued that reciprocity and trust are required to generate knowledge flow; function of recognition, rewards, and encouragement.
Das & Teng, 2001	Theoretical	Commentary	Trust; Control; Risk Perception	Research showed that Trust, as well as Control are two discrete avenues to Risk Reduction in alliances. Researches provide guidance for effective risk management within alliances.
McKnight & Chervany, 2001	Theoretical	Commentary	Dispositional Trust; Institutional Trust; Interpersonal Trust;	Described and defined a Trust typology presenting Trust as a coherent set of four concepts and ten sub-

				constructs; model developed presents a vocabulary of specifically defined types of Trust.
Olk & Elvira, 2001	Empirical	208 MBA students	Equity Control; Technical Scope; Contract Type; Trust; Friendship; Discretion	Research purported creating alliances for the attainment of high goals required discretion in the formation of relationships. Study showed the association between interpersonal relationships and alliance structure to be complex in nature.
Bartol & Srivastava, 2002	Theoretical	Commentary	Knowledge Contributions to Databases; Knowledge Sharing in Formal Interactions; Knowledge Sharing in Informal Interactions; Communities of Practice	Research suggested that rewards are important for most mechanisms of knowledge sharing; must be effective guidelines for the use and administration of rewards, a condition of Trust.
Bell, Oppenheimer, & Bastien,	Empirical (Survey)	17 respondents	Ability; Benevolence; Integrity	Research suggested that all three aspects

2002				of trust (ability; benevolence; integrity matter in the building of relationships.
Crowe, Fong, Bauman, & Zayas-Castro, 2002	Empirical (Survey)	7 respondents (Organizations)	BPR Effort; Egalitarian Leadership; Working Environment; Top Management Commitment; Managerial Support; Employee Resistance	Development of a tool designed to quantitatively estimate the potential risk level of a proposed business process reengineering initiative before the organization commits resources to the effort; BPRs generally have a high failure rate.
Das & Teng, 2004	Theoretical	Commentary	Trust Propensity; Risk Propensity; Subjective Trust; Perceived Risk; Behavioral Trust; Risk Taking	Trust can refer to 3 different concepts – an expectation, a behavioral outcome based upon expectation, personal or situational characteristics that are basis for an expectation; risk is a concept associated with the truster.
Lucas, 2005	Empirical (Survey)	206 Respondents	Department Tenure; Organization	Study demonstrated a requirement for

			Tenure; Education Level; Collaborative Culture; Trust; Provider Reputation; Recipient Reputation; Knowledge Transfer	Trust if Knowledge Transfer is to occur; Reputation of Knowledge Provider is important to the Knowledge Recipient; Reputation of the Recipient is equally as important.
Mooradian, Renzl, & Martzler, 2006	Empirical (Survey)	64 respondents	Agreeableness; Interpersonal Trust in Peers; Interpersonal Trust in Management; Sharing Within Team; Sharing Across Teams; Propensity to Trust	Research argued that organizations might be able to identify “boundary spanners”, those workers having personality agreeableness and propensity to trust affecting positive “downstream” knowledge sharing behaviors with other teams.
Casalo, Flavian, & Guinaliu, 2007	Empirical (Survey)	354 Spanish- speaking Internet users (respondents)	Trust; Satisfaction; Reputation; Commitment	Research demonstrated Trust and Commitment are two key variables in a long-term relationship; improvement to levels of customer satisfaction and

				organizational reputation will enhance customer Trust and Commitment.
Jøsang, Ismail, & Boyd, 2007	Theoretical	Commentary	Reputation; Trust	Analysis focused on the current state of literature focused on Trust and Reputation systems; a criterion for the evaluation current Reputation and Trust systems was presented.
Søndergaard, Kerr, & Clegg, 2007	Empirical (Interview)	20 New Product Design Engineers	Organizational Factors; Individual Factors; Leadership; Knowledge Sharing Culture; Knowledge Sharing Behaviors	Study demonstrated that knowledge management (knowledge sharing) is a social rather than technical process; core task of the organization is managing meta-knowledge and making knowledge available.
Renzl, 2008	Empirical (Survey)	68 respondents	Trust in Management; Knowledge Sharing Within Teams; Knowledge Sharing	Study showed that Trust in Management has an impact on knowledge sharing within and between

			Between Teams; Documentation; Trust in Management; Fear of Losing One's Unique Value	teams. Study showed that willingness plays a major role in the documenting of knowledge; in a trusting atmosphere, individuals are more likely to document knowledge.
Holste & Field, 2010	Empirical (Survey)	202 participants	Willingness to Share Tacit Organizational Knowledge; Willingness to Use Tacit Organizational Knowledge	Research determined that both affect-based and cognition-based trust positively influences an individual's willingness to share and use tacit knowledge.
Xu, Kim, & Kankanhalli, 2010	Empirical (Survey)	Total of 425 respondents to 2 separate surveys: Survey 1 – 215 respondents; Survey 2 – 210 respondents	Perceived Information Relevance; Perceived Relational Benefit; Information Type; Preference for a Source; Sourcing Frequency	Study suggested that information seekers manage their relationship with information source; emphasis on cordial relationship. IT theoretically connects everyone.
Powley & Nissen, 2012	Empirical (Simulation)	136 graduate students	High Trust – Flexible Organization; Low Trust – Flexible	Research reflected organizations with high levels of

			Organization; High Trust – Hierarchical Organization; Low Trust – Hierarchical Organization	trustworthiness have high levels of performance; flexible organizations address crisis issues better than hierarchical organizations.
Chen, Wu, & Cheng, 2013	Empirical (Survey)	513 participants	Affective Repair; Functional Repair; Informational Repair; Locus of Causality; Controllability; Stability; Positive Moods; Post-encounter Trust	Research focused on trust violations and coping strategies. Research demonstrated that an individual's mood is a mediator is trust repair.

### *Collaborative Environment*

Amabile, Patterson, Mueller, Wojcik, Odomirock, and Marsh (2001) described collaboration as the process of “individuals who differ in notable ways sharing information and working towards a particular purpose” (p. 419). Melin and Persson (1996) stated a similar understanding of collaboration, pointing out the importance of communication as well as the “sharing of competences and resources” (p. 363). Ariño and de la Torre (1998), Crowe, Fong, and Zayas-Castro (2002), as well as Weick and Roberts (1993), asserted that a cooperative (collaborative) environment is one of the critical success factors in KM initiatives. Sonnenwald (2007) as well as van den Hooff, Schouten, and Simonovski, (2012) emphasized the social context of collaborations. A



cooperative environment, with friendly interaction in which people work in teams, has a chance of improving performance and productivity (Green & Roseman, 2000; Marir & Mansar, 2004; Tatsiopoulos & Panayiotou, 2000; Zolin & Hinds, 2004). Ultimately, knowledge workers seek to share knowledge to facilitate learning (Larsson, Bengtsson, Henriksson, & Sparks, 1998; Marjanovic, 1999; Ring & Van de Ven, 1994; Wasko & Faraj, 2000).

Stein and Zwass (1995), as well as Mudambi and Helper (1998), argued that for shared knowledge to be meaningfully used, the knowledge needed to be coupled with mechanisms supporting the organization, retention, maintenance, as well as the search and retrieval of the knowledge. Literature has identified an abundance of individual, technology, group process, and organizational factors impacting the use, re-use, and sharing of knowledge (Rice & Gattiker 1999; Sambamurthy & Chin 1994). Kraemer and Pinsonneault (1990) asserted that this mixture of factors makes it difficult to determine which factors apply to which knowledge sharing challenges and potential solutions. Table 8 presents a summary of the literature related to a *willingness to share within a collaborative environment* – its findings and contributions.

Table 8. Summary of Literature – Collaborative Environment as an Influence on an Analyst's Willingness to Contribute Knowledge to a KMS.

<b>Study</b>	<b>Methodology</b>	<b>Sample</b>	<b>Instrument / Construct</b>	<b>Main Findings or Contributions</b>
Kraemer & Pinsonneault, 1990	Theoretical	Commentary	Group Decision Support Systems (GDSS); Group Communication Support Systems (GCSS)	GDSS are found to be effective at consensus building and imbuing confidence in group made decisions;

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				GCSS decrease consensus reaching and increase time to reach a decision; both increase the analysis as well as participation.
Sambamurthy & Chin, 1994	Empirical	36 groups (total of 168 undergraduate students)	Technocentric Perspective; Social Perspective; GDSS Design; Group Attitude Toward GDSS; GDSS Perceived Ease of Use; GDSS Usefulness	Study concluded GDSS design capabilities influences group decision-making performance; also influences group's perceived GDSS usefulness and ease of use; Perceived usefulness and EOU influences the use of GDSS in decision-making.
Stein & Zwass, 1995	Theoretical	Commentary	Layer 1 (Integrative Subsystem; Adaptive Subsystem; Goal Attainment Subsystem; Pattern Maintenance Subsystem); Layer 2 (Mnemonic Functions)	Proposed an Organizational Management Information System (OMIS) model rooted in the construct Organizational Effectiveness; Core competence of an organization rooted in the experiential

				knowledge of its members.
Melin & Persson, 1996	Theoretical	Commentary	Collaboration; Co-Authorship; Bibliometric Data	Research focused on the measurement and statistical analysis of co-authorship collaboration.
Ariño & de la Torre, 1998	Empirical (Longitudinal Study)	2 multi-national firms	Negotiation & Commitment; Execution; New Equilibrium; Readjustment; Re-evaluation; Dissolution; External Change; Unilateral Reaction	Research focused on the development of a model that examined the efficiency and equity conditions between partners in a joint venture; collaboration is determined by initial conditions (agreements). Misconfigured, no amount of follow-on relationship building will compensate.
Rice & Gattiker, 1999	Theoretical	Commentary	Meanings and Relations; Development and Use of Computer-mediated Communication and Information Systems; Processes of Transformation; Communication	Research suggested both latent and explicit themes relative to theory and research on organizational structure as well as evolving communication and information

			and Information Systems Organizational Influencer	systems.
Green & Roseman, 2000	Theoretical	Commentary	Conceivable State Space; Lawful State Space; Conceivable Event Space; Lawful Event Space	Examined the Bunge-Wand-Weber Model ontological constructs; Analysis conducted argued that the process view of organization is insufficient to examine all real world constructs.
Amabile, Patterson, Mueller, Wojcik, Odomirock & Walsh, 2001	Empirical (Case Study)	14 team members; 26 vignettes; 6 organizations	Collaborative Team Characteristics; Collaboration Environment Characteristics; Collaboration Processes	Determined incompatible of member problem-solving styles can lead to conflict (Collaborative Team Characteristic); Institutional support for each member is key (Collaboration Environment Characteristic); Project success is driven by effective use of member capabilities as well as well planned meetings.

Tatsiopoulous & Panayiotou, 2000	Empirical	2 pilot user companies	Business Process Modeling; Performance Model; Benchmarking; Reengineer Targets Evaluation	Contributed to an understanding of the role of the individual in business process reengineering and process evaluation.
Wasko & Faraj, 2000	Empirical (Survey)	173 respondents	Individual Motivations; Structural Capital; Cognitive Capital; Relational Capital; Knowledge Contribution	Study showed that a significant predictor of individual knowledge contribution is the perception of enhanced professional reputation; the importance and value of reciprocity in knowledge exchange may be generalized; significantly, reputation and centrality must be present for knowledge contribution.
Büchel, 2002	Theoretical	Commentary	Formation; Evaluation; Adjustment	Commentary argued that the first step in establishing a joint venture is to determine a strategic intent; creates points of reference that reduce ambiguity.

Crowe, Fong, Bauman, & Zayas-Castro, 2002	Empirical (Survey)	7 respondents (Organizations)	BPR Effort; Egalitarian Leadership; Working Environment; Top Management Commitment; Managerial Support; Employee Resistance	Development of a tool designed to quantitatively estimate the potential risk level of a proposed business process reengineering initiative before the organization commits resources to the effort; BPRs generally have a high failure rate.
Li, Karakowsky, & Lam, 2002	Empirical (Survey)	2710 business firms	Firm Age; Equipment Value per Employee; Debt Ratio; Firm Profitability; Firm Efficiency in Marketing; Asset Growth	Research showed that culturally balanced firms had significantly higher performance in all measurement areas.
Maul, Tranfield, & Maul, 2003	Empirical (Interview)	33 Organizations	Strategy; Cost Focus; Service Improvement; Process Architecture; Structural Reconfiguration; Cultural Change; Effect of IT	From a strategic, change management perspective, examined leadership's role in organizational reengineering towards performance

				improvement; end state is a learning organization.
Marir & Mansar, 2004	Theoretical	Commentary	Design View; Operations View	Developed case-based reasoning for business process redesign to improved existing business processes.
Ojha, 2005	Empirical (Survey)	588 respondents representing 20 organizations	Age; Organizational Tenure; Work Experience; Level of Qualification; Native Language	Research determined Organizational Tenure was the greatest influencer in knowledge sharing teams.
Sonnenwald, 2007	Theoretical	Commentary	Foundation; Formulation; Sustainment; Conclusion	Introduces the four stages of scientific collaboration highlighting the difficulty and complexity of it; individuals and organizations should consider the costs and benefits before entering into collaborative enterprises.
Abdolvand, Albadvi, & Ferdowsi, 2008	Theoretical; Empirical	2 Iranian companies; 325 total respondents	Egalitarian Leadership; Collaborative Working	Contributed to an understanding of KM in

			Environment; Top Management Commitment; Management Systems; Information Technology	support of business process reengineering.
van den Hooff; Schouten, & Simonovski, 2012	Empirical (Survey)	252 respondents	Eagerness; Willingness; Knowledge Sharing Intention; Pride; Empathy	Research suggested that pride and empathy (indeed all emotions) have an influence on an individual's willingness to share knowledge.

### *Resistance to Sharing*

Research has shown that minority status or diversity in team members can be a factor in knowledge sharing (Cummings, 2004). Ojha (2005) suggested that team members who thought of themselves as being in the minority based on gender, marital status, or education were less likely to share knowledge with other team members. Studies conducted by Phillips, Mannix, Neale, and Gruenfeld (2004), as well as Thomas-Hunt, Ogden, and Neale (2003) showed that socially isolated members of a team were more likely to disagree with other team members, while also being less likely to contribute their unique knowledge within the context of a heterogeneous team.

International business subsidiaries and multi-national corporations encompassing employees of diverse national cultures, along with different languages can pose challenges to knowledge sharing (Crowe, Fong, Bauman, & Zayas-Castro (2002); Ford &



Chan, 2003; Minbaeva, 2007). For example, Sawng, Kim, and Han (2003) found that large corporations that also supported research and development teams had a higher incidence of knowledge sharing when team composition reflected a high female to male ratio. From a cultural perspective, Chow, Deng, and Ho (2000) as well as Chow, Harrison, McKinnon, and Wu (1999) determined that Chinese team members share knowledge for the good of the organization, even when sharing this knowledge was potentially personally disadvantageous to the employee. Chow et al. (2000) also found that Chinese team members were less likely to share lessons learned with anyone outside of their work group than were American team members.

Dweck and Leggett (1988) determined that high performing, goal oriented knowledge workers were more concerned about demonstrating their competence – performing effectively while avoiding risks and negative judgments – than they were with knowledge sharing. High performing knowledge workers believed that knowledge sharing detracted from the time and effort available for work activities that could result in their receiving greater personal benefits and rewards (Husted & Michailova, 2002; Szulanski, 1996; Zand, 1972). Oldham (2003) demonstrated further that high performing employees simply might not want to devote the time necessary to mentor others who themselves are attempting to understand and apply the shared knowledge in their work.

Table 9 presents a summary of the literature related to *resistance to sharing as an influence on an Analyst's willingness* to contribute Knowledge to a KMS – its findings and contributions.

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Table 9. Summary of Literature – Resistance to Sharing as an Influence on an Analyst's Willingness to Contribute Knowledge to a KMS.

<b>Study</b>	<b>Methodology</b>	<b>Sample</b>	<b>Instrument / Construct</b>	<b>Main Findings or</b>
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				<b>Contributions</b>
Zand, 1972	Empirical (Questionnaire)	64 participants	Trust; Control; Information; Influence	Research focused on a model designed to test problem solving effectiveness. Members involved with group work have 2 concerns: (1) the problem itself; (2) how the members relate to each other.
Dweck & Leggett, 1988	Theoretical	Commentary	Entity Intelligence; Incremental Intelligence; Goal Orientation; Perceived Present Ability; Behavior Pattern	Research focused on underlying personality variables can translate into motivational processes producing patterns of behavior, cognition, and affect.
Szulanski, 1996	Empirical (Survey)	271 respondents; 8 organizations	Stickiness Outcome; Stickiness Initiation; Stickiness Ramp-up; Stickiness Integration; Causal Ambiguity; Unproven Knowledge; Source Lacks Motivation;	Study revealed 3 knowledge barriers restricting knowledge sharing: lack of absorptive capacity of the recipient; causal ambiguity; and, an arduous relationship between the source and the

			Source Lacks Absorptive Capacity; Recipient Lacks Retentive Capacity; Barren Organizational Context; Arduous Relationship	recipient.
Chow, Harrison, McKinnon, & Wu, 1999	Empirical (Survey)	52 respondents from 13 companies	Individualism/Collectivism; Concept of Face; Power Distance	Research showed Taiwanese managers more likely to share knowledge for the good of the company at the expense of personal risk; Australian managers share a matter of personal choice and individual assertiveness.
Chow, Deng, & Ho, 2000	Empirical (Survey)	142 respondents	Specific Aspects of National Culture (US); Specific Aspects of National Culture (PRC); Nature of the Knowledge; Knowledge Recipient's Relationship with Knowledge Sharer	Research revealed that both cultures share knowledge when there is no conflict between collective and self-interests; when conflict does exist, US culture less willing to share knowledge than PRC culture.

Crowe, Fong, Bauman, & Zayas-Castro, 2002	Empirical (Survey)	7 respondents (Organizations)	BPR Effort; Egalitarian Leadership; Working Environment; Top Management Commitment; Managerial Support; Employee Resistance	Development of a tool designed to quantitatively estimate the potential risk level of a proposed business process reengineering initiative before the organization commits resources to the effort; BPRs generally have a high failure rate.
Husted & Machilova, 2002	Theoretical	Commentary	Knowledge Transmitter Behavior; Knowledge Recipient Behavior; Transmitter & Receiver Shared Understanding of the Content of the Knowledge	Researchers argued that knowledge sharing is dependent on the willingness of the knowledge possessor to indicate possession of the knowledge as well as his/her willingness to share it.
Ford & Chan, 2003	Empirical (Case Study)	51 participants	Power Distance; Individualism / Collectivism; Uncertainty Avoidance; Masculinity / Femininity; Long-Term Orientation	Research emphasized the importance of knowledge sharing practices as well as understanding knowledge flow between individuals.
Oldham, 2003	Theoretical	Commentary	Personal	Research argued

			Conditions; Contextual Conditions; Formulation of Creative Ideas; Willingness to Share Ideas	for additional study of contextual conditions affecting the formulation and sharing of new ideas.
Sawng, Kim, & Han, 2003	Empirical (Survey)	133 R&D Teams representing 58 firms	Task Characteristics; Interdependence; Group Cohesiveness; Knowledge Creation Activities; Knowledge- sharing Activities	Regardless of the firm type, R&D group characteristics were strongly related to Knowledge- sharing activities; Group cohesiveness had a positive impact on knowledge creation as well as knowledge sharing; task structure, interdependence, and group cohesiveness positively impacted knowledge creation.

Thomas-Hunt, Ogden, & Neale, 2003	Empirical (Survey)	111 undergraduate engineering or business major students	Social Status; Knowledge Exchange; Perceived Expertise	Research study revealed that the degree of emphasis participants place on an individual's unique knowledge does affect group performance; experts are more participative in discussions – emphasizing the unique knowledge of other participants than non-experts.
Cummings, 2004	Empirical	182 work groups	Demographic Diversity; Knowledge Sharing; Performance; Structural Diversity;	Research argued that external knowledge sharing is more valuable when work groups are more structurally diverse; the effect on work group performance was significantly affected.

Phillips, Mannix, Neale, & Gruenfeld, 2004	Empirical	Two experiments: (1) 122 MBA students from 3 classes; (2) 172 MBA students from 4 classes	Congruent Social and Knowledge Ties; Incongruent Social and Knowledge Ties	Research clarified understanding of interaction between social and knowledge ties; Congruent groups are more successful at solving a mystery than Incongruent groups only when a minority is present.
Ojha, 2005	Empirical (Survey)	588 respondents representing 20 organizations	Age; Organizational Tenure; Work Experience; Level of Qualification; Native Language	Research determined Organizational Tenure was the greatest influencer in knowledge sharing teams.
Holste & Field, 2010	Empirical (Survey)	202 participants	Willingness to Share Tacit Organizational Knowledge; Willingness to Use Tacit Organizational Knowledge	Research determined that both affect-based and cognition-based trust positively influences an individual's willingness to share and use tacit knowledge.

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## Opportunity to Contribute Knowledge to a KMS

### *Organization Structure*

Employers place a high value on employee loyalty and dedication. Over the course of several decades, it was found that employees who are emotionally committed to

the organization demonstrate heightened performances, reduced absenteeism, and are less likely to quit their job (Mathieu & Zajac, 1990; Mowday, Porter, & Steers, 1982). In contrast, employees are more concerned with their organization's commitment to them (Meyer & Allen, 1997). To an employee, being valued by an organization suggests approval and respect, as well as the rewards of pay and promotion. Being valued by the organization can also provide the employee entrée to information and other resources needed to succeed in the workplace (Astley & Sachdeva, 1984; Mowday, Porter, & Steers, 1982). Social exchange theorists (Bateman & Organ, 1983; Brief & Motowidlo, 1986; Etzioni, 1961; Gould, 1979; Levinson, 1965; March & Simon, 1993; Mowday et al., 1982; Organ & Konovsky, 1989; Steers, 1997) commonly referred to employment as the reciprocal exchange of an employee's effort and loyalty for tangible benefits as well as social rewards.

*Social Exchange Theory (SET)* stresses the norm of reciprocity in human relations (Gouldner, 1960). *Social exchanges* entail unspecified obligations in which one party (person/organization) receives favorable treatment from a second party – who returns the favor in-kind (Bartol, Liu, Zeng, & Wu, 2009). *Organizational support theory*, as suggested by Eisenberg, Huntington, Hutchison, and Sowa (1986), applies the reciprocity norm to employee-employer relationships. It also holds true that employees' perceptions of support from an organization will provide them with a pathway to remuneration by acting in ways valued by the organization (Eisenberger, Armeli, Rexwinkel, Lynch, & Rhoades, 2001).

While it has been argued that a strong relationship exists between organizational support and knowledge sharing, Rousseau (1995), Shore and Barksdale (1998), as well as



Tsui, Pearce, Porter, and Tripoli (1997) suggested that other undercurrents exist that may modify or undermine the nature or capacity of the connection. Tsui et al. (1997) advanced four types of inducement-contribution relationships – two balanced, two unbalanced – between employers and employees. Of importance here is the unbalanced relationship in which employer proffered inducements directed toward the employee, do not match the desired or needed interests of the employee. This “underinvestment” in the employees may influence knowledge sharing within the organization (Tsui, et al., 1997, p. 1093).

*Organizational support theory* suggested that when an organization demonstrates concern for an employee’s well-being – and/or expresses value in an employee’s contributions to the organization – higher levels of organizational support would be perceived by the employee (Eisenberger et al., 1986; Rhoades, Eisenberger, & Armeli, 2001; Shore & Shore, 1995). Organizational support theory postulates that by creating a sense of obligation within the individual, the organization impacts the employee’s sense of reciprocity – creating attitudes and behaviors resulting in reciprocation (Eisenberger et al., 1986; Gouldner, 1960). Table 10 presents a summary of the literature related to *organization structure* as an influence for Analysts to contribute knowledge to a KMS – its findings and contributions.

Table 10. Summary of Literature – Organization Structure as an Influence for Analysts to Contribute Knowledge to a KMS.

<b>Study</b>	<b>Methodology</b>	<b>Sample</b>	<b>Instrument / Construct</b>	<b>Main Findings or Contributions</b>
Gouldner, 1960	Theory	Commentary	Complementarity; Exploitation	Commentary focused on knowledge sharing occurring within an organization

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				only between those who reciprocate.
Etzioni, 1961	Theoretical	Commentary	Social Order; Power; Compliance; Involvement	An examination of the different forms of compliance associated with attainment of different organizational goals; different levels of organizational effectiveness based upon various combinations of compliance and goals.
Levinson, 1965	Theoretical	Commentary	Individual Reciprocation Affect; Organizational Reciprocation Affect	Commentary focused on reciprocation; the process whereby the individual shapes the organization and vice versa.
Hage, Aiken, & Marrett, 1971	Empirical (Survey)	16 social welfare and rehabilitation organizations	Scheduled Communications; Unscheduled Communications; Complexity; Formalization	Researchers argued that the mechanism employed to affect coordination within the organization influences the volume and direction of communications. As the organization

				diversifies, and the employees become more specialized, communications flow increases.
Steers, 1977	Empirical (Survey)	382 hospital employees plus 119 scientists and engineers	Personal Characteristics; Job Characteristics; Work Experience; Organizational Commitment; Desire and Intent to Remain; Behaviors	Research revealed that employees come to the organization to have certain needs fulfilled; when/where the organization meets these needs, employee commitment is achieved.
Gould, 1979	Theoretical	Commentary	Alienative Involvement; Calculative Involvement; Moral Involvement	Commentary focuses on modification of Equity-Exchange Theoretical Model to include Alienative, Calculative, and Moral Involvement. Implication for managers is Morally involved employees want to make a significant contribution to work.
Mowday, Porter, & Steers, 1982	Theoretical	Commentary	Commitment; Absenteeism	Researchers attempt to add a time and process dimension to

				Commitment; correlate both to organizational commitment.
Bateman & Organ, 1983	Empirical (Longitudinal Study)	77 participants from single Midwestern university	Job Satisfaction; Job Performance; Citizenship Behaviors	Study showed that Citizen Behaviors positively influence job satisfaction as well as performance.
Astley & Sachdeva, 1984	Theoretical	Commentary	Hierarchical Authority; Resource Control; Network Centrality	Recognized that hierarchical power was based upon formal authority; formal authority allows the control of critical resources.
Brief & Motowidlo, 1986	Theoretical	Commentary	Helping; Sharing; Donating; Cooperating; Volunteering	Research introduces the construct "prosocial organizational behavior"; 13 forms are presented.
Eisenberg, Huntington, Hutchison, & Sowa, 1986	Empirical (Survey)	361 respondents; 9 different organizations	Organizational Commitment; Organizational Support; Employee Commitment	Research supports Social Exchange view that employee commitment to organization is strongly influenced by employee perception of organizational commitment to them.

Organ & Konovsky, 1989	Empirical (Survey)	369 respondents from 2 hospitals	Pay Cognitions; Job Cognitions	Research focused on Organizational Citizenship Behavior as a function of employee's subjective appraisal of fairness as it relates to management.
Mathieu & Zajac, 1990	Theoretical	Commentary	Personal Characteristics; Job Characteristics; Group-Leader Relations; Organizational Characteristics; Role States	Using meta-analysis Study reviewed previous empirical studies examining the antecedents, correlates, and consequences of organizational commitment.
March & Simon, 1993	Theoretical	Commentary	Organizational Behavior; Intra-organizational Decisions; Conflict in Organizations; Rationality; Planning and Innovation	Introduction to Organizational Theoretical as it relates to formal organizations.
Dutton, Dukerich, & Harquail, 2002	Theoretical	Commentary	Organizational Images; Identification; Principals of Self Definition	Research suggested that an employee's perception of the organization structure shaped the strength of his/her identification (sense of

				membership) with the organization.
Rousseau, 1995	Theoretical	Commentary	Contractual Thinking; Contract Makers; Contract Forms; Contract Violations; Linking Organizational Strategy to Contracts; Social Changes in Contracts	Research offers a behavioral theory focused on contracts; contracts, written or unwritten and understood, are a pervasive aspect of organizational life.
Shore & Shore, 1995	Theoretical	Commentary	Perceived Organizational Support; Organizational Justice	Research argued that both Perceived Organizational Support and Organizational Justice influence employee attitudes and behavior.
Meyer & Allen, 1997	Theoretical	Commentary	Employee Commitment; Organizational Commitment	Research focused on three components of commitment: affective, continuance, normative.
Tsui, Pearce, Porter, & Tripoli, 1997	Empirical	10 industries with more than 1000 employees; 453 employees for hypotheses testing on performance outcomes; 757 employees for	Four Employee-Organizational Relationship Approaches: Overinvestment (Employer) Relationship; Mutual Investment Relationship;	Research study reflected, in general, employees work better in an Overinvestment or Mutual Investment relationship than when the worked

		hypotheses testing on attitudinal outcomes; 205 supervisors also participated	Quasi-Spot-Contract Relationship; Underinvestment Relationship	in a Quasi-Spot-Contract or Underinvestment relationship.
Shore & Barksdale, 1998	Empirical (Survey)	327 Working MBA Students	Degree of Balance in Employee and Employer Obligations; Level of Obligation	Research findings confirmed that the employee and management relationship can be conceptualized as an exchange relationship.
Eisenberger, Armeli, Rexwinkel, Lynch, & Rhoades, 2001	Empirical (Survey)	413 postal employees	Perceived Organizational Support; Exchange Ideology; Felt Obligation; Positive Mood; Affective Commitment; Organizational Spontaneity; In-role Performance; Withdrawal Behavior	Research found that Perceived Organizational Support (POS) was positively related to an employee's commitment to the organization's welfare and achievement of objectives.
Gold, Molhatra, & Segars, 2001	Theoretical	Commentary	Knowledge Infrastructure Capability; Knowledge Process Capability; 7 sub-constructs	Organizational Effectiveness as a function of Knowledge Infrastructure Capability and Knowledge Process Capability.
Rhoades, Eisenberger, &	Empirical (Survey)	3 studies; 367 employees	3 studies examined the	The results of the 3 research

Armeli, 2001		from a variety of organizations	relationships between: Perceived Organizational Support; Affective Commitment; Employee Turnover	studies suggests perceived organizational support leads to affective employee commitment with reduced employee turnover.
Crowe, Fong, Bauman, & Zayas-Castro, 2002	Empirical (Survey)	7 respondents (Organizations)	BPR Effort; Egalitarian Leadership; Working Environment; Top Management Commitment; Managerial Support; Employee Resistance	Development of a tool designed to quantitatively estimate the potential risk level of a proposed business process reengineering initiative before the organization commits resources to the effort; BPRs generally have a high failure rate.
Bartol, Liu, Zeng, & Wu, 2009	Empirical (Survey)	255 Information Technology Professionals from China	Perceived Organizational Support; Knowledge Sharing Behavior; Job Security	Research found a positive correlation between Perceived Organizational Support, Knowledge Sharing, and perceptions of Job Security.



Within the context of this study, the use of KMS draws upon three complementary streams of research: *Computer Self-Efficacy (CSE)* – defined as an individual’s belief in his/her ability to use computers in the determination of computer use when faced with a new or unfamiliar situation; *Task-Technology Fit (TTF)* – defined as a technology providing features that support or ‘fit’ the requirements of the task; and, *User Attitudes Toward Technology* (Compeau & Higgins, 1995; DeLone & McLean, 1992; Goodhue & Thompson, 1995; Igbaria, Parasuraman, & Baroudi, 1996; Legris, Ingham, & Collerette, 2003; Smith, Caputi, Crittenden, Jayasuriya, & Rawstorne, 1999). While each of these perspectives gives insight into the impact on a knowledge worker’s use of information technology, each alone has important limitations.

Compeau, Higgins, and Huff (1999) have defined *self-efficacy* as an individual’s perception of his/her ability to organize and execution actions necessary to achieve a specified performance level in specified tasks (Compeau et al., 1999). As a concept, *self-efficacy* is fixed in Bandura’s (1986) *Social Cognitive Theory (SCT)*. SCT describes human behavior as the interaction between environmental factors, personal factors, and behaviors (Compeau & Higgins, 1995; Gong, Xu, & Yu, 2004). The triumvirate relationship between environmental factors, personal factors, and behaviors is both interactive as well as reciprocal in nature (Compeau & Higgins, 1995). In the development of individual behaviors, Bandura (1986) also suggested that environmental factors play a role on individual behaviors. Bandura (1986) and Gist (1987) argued that self-efficacy influences individual behavior, the limits of the level of effort they are willing to expend, as well as their level of persistence when faced with obstacles to success. In summary, an individual with a high-level of self-efficacy is likely to expend

more effort, and be more persistent in working toward a goal than someone with a lower sense of self-efficacy (Gist & Mitchell, 1992). As a concept, CSE developed from the literature on self-efficacy (Compeau & Higgin, 1995; Smith, Caputi, Crittenden, Jayasuriya, & Rawstorne, 1999). Compeau and Higgins (1995) defined CSE as “a judgment of one’s ability to use a computer” (p. 192). Further, research conducted by Marakas, Yi, and Johnson (1998) suggested that those individuals who placed greater stock in their CSE beliefs were more likely to report higher perceptions of usefulness, as well as ease of use.

With respect to this research study, Marakas et al. (1998) discovered further that CSE *positively influences* beliefs about the use of information systems. Hsu and Chiu (2004) also determined that CSE had positive effects on the use of information systems. In literature, the concept of information system usage is widely recognized as a condition of system acceptance (Davis, 1989; Hasan & Ali, 2004). Previous literature has pointedly discussed how CSE affects the use of technology in the workplace resulting in increased user productivity, job performance, and effectiveness (Marakas et al., 1998; Havelka, 2003; Ndubisi & Jantan, 2003). Identifying the determinants of such acceptance, however, has proven to be the more challenging task (Igarria & Iivari, 1995; Levy & Green, 2009; Money & Turner, 2005; Venkatesh, Morris, Davis, & Davis, 2003).

An individual’s use of a particular information technology is not always a matter of choice (Goodhue, 1986). Goodhue and Thompson (1995) determined that in many cases, the ‘choice’ of the information technology in use is a function of the design of a user’s job, rather than the quality or usefulness of the technology employed, or the attitude of the knowledge worker employing the technology. To the extent that a

technology is used – since its use is not voluntary – will depend increasingly on *task-technology fit* rather than use (DeLone & McLean, 1992). There is also explicit recognition that increased use of a system does not necessarily equate to a higher performance level (Pentland, 1989).

Alavi and Leidner (2001), Adams and Lamont (2003), as well as Lien, Hung, and McLean (2007) argued that a KMS should provide appropriate functions to support user tasks. KMS must be designed to capture the right knowledge (combining sufficient content with context) to accomplish assigned tasks resulting in both improved job performance and enhanced productivity (Lien, Hung, & McLean, 2007). If a user perceives that a KMS does not benefit his/her job, s/he will regard the KMS as useless, and as a result will not use the system (Adams & Lamont, 2003).

A key concern in the information systems research has been gaining a better understanding of the linkage between information technology and individual performance (Cheney, Mann, & Amoroso, 1986; Davis, 1989; Davis, Bagozzi, & Warsaw, 1989; Doll & Torkzadeh, 1991; Lucas, 1975, 1981; Robey, 1979; Swanson, 1982, 1987; Thompson, Higgins, & Howell, 1991). Much of the research in literature is based on theories of attitudes and behaviors (Bagozzi, 1981, 1982; Fishbein & Ajzen, 1975; Triandis, 1994). Aspects of the technology (e.g., high quality, intuitive systems) lead to user attitudes (e.g., beliefs, affects) about a system's usefulness (Lucas, 1975; Agarwahl & Karahanna, 2000). Attitudes, cultural norms, as well as other situational factors, promote a user's intention to use a KMS (Hartwick & Barki, 1994; Moore & Benbasat, 1992). Table 11 presents a summary of the literature related to *ease of use* as an influence for Analysts to contribute knowledge to a KMS – its findings and contributions.

Table 11. Summary of Literature – Ease of Use as an Influence for Analysts to Contribute Knowledge to a KMS.

<b>Study</b>	<b>Methodology</b>	<b>Sample</b>	<b>Instrument / Construct</b>	<b>Main Findings or Contributions</b>
Fishbein & Ajzen, 1975	Theoretical	Commentary	Belief formation; Attitude formation; Formation of Intentions; Behaviors	Study focused on attitude theory and measurement; Principles of change; Predicting behaviors; Persuasive communication
Lucas, 1975	Theoretical (Descriptive Model)	One company comprised of 3 Divisions; Participants were Sales force & Account Executives within the Divisions	Situational performance; Personal descriptors; Use of system; Decision style; Attitudes & Perceptions	Study determined length of time in a position is a consistent predictor of performance when using IS; Use of supporting IS is a function of different user profiles (Personal attributes; decision style; attitude and perception).
Robey, 1979	Empirical (Survey)	66 Sales force participants from one industrial products manufacturer	% of Customer Records updated daily; # of Customer Records per Account; User Attitude toward supporting IS; Rewards; Goals	Study results support notion that user attitude has significant correlation to system use; Established expectancy model of User

				use of supporting IS.
Bagozzi, 1981	Empirical (Longitudinal Field Study)	157 students, faculty, & staff	Attitude; Past Behavior; User Intentions; Subsequent Behavior	Research addressed attitudes influence behavior but only indirectly as a function of impact on user intentions.
Lucas, 1981	Theoretical	Commentary	IS Environment; IS Analysis & Design; IS Life cycle; IS Management	Study focused on the technology & design process for building IS environment in which analysts and users can interact to develop successful system.
Bagozzi, 1982	Empirical (Longitudinal Field Study)	Two groups composed of 50 participants each	Expectancy-value judgments; Affects; Intentions; Behavior	Research study proposed a new model is proposed representing attitudinal reactions to current information systems integration approaches
Swanson, 1982	Theoretical	Commentary	Implementation Perspective; Information Perspective	Study introduced the construct channel disposition – one aspect of an individual's

				attitude toward an information system.
Bandura, 1986	Theoretical	Commentary	Social Cognitive Theory (SCT); self-efficacy	Research study contributed to the understanding the human dimension in the empathic, self-regulatory, cognitive, and self-reflecting processes enabling adaptation and change.
Cheney, Mann, & Amoroso, 1986	Theoretical	Commentary	Controllable variables; Partially Controllable variables; Uncontrollable variables	Literature review of organizational context variables affecting the success or failure of end-user computing in organizations.
Goodhue, 1986	Empirical	600 participants from 2 organizations	User attitudes as predictors of utilization; Task-technology fit as a predictor of performance	Research study proposed new model supporting theory that technologies add value to individual performance.
Gist, 1987	Theoretical	Commentary	Self-efficacy; Group Dynamics; Organizational Behavior	Research study contributed to understanding theoretical link between self-

				efficacy other constructs within organizational behavior literature.
Swanson, 1987	Theoretical	Commentary	Unit of Analysis; Explanatory Focus	Review of literature associated with the determinants and effects of organizational information system use.
Davis, 1989	Theoretical; Empirical (Survey)	152 Users	Perceived usefulness; EOU; User Acceptance of Technology (Usage)	Research study determined that User perceived usefulness and EOU impacted positively on current and future use of technology.
Davis, Bagozzi, & Warsaw, 1989	Empirical (Longitudinal Study)	107 Users	Perceived EOU; User Intentions; User Attitudes	Research study contributed to an understanding of user intention and user attitude toward perceived EOU.
Pentland, 1989	Empirical (Survey)	2 Surveys; Survey 1 – 1110 participants; Survey 2 – 1851 participants	Use; Efficiency; Effectiveness; Training; Management Policy; User Characteristics	Study showed that any technology could boost productivity if applied by a skilled worker to the appropriate

				task.
Doll & Torkzadeh, 1991	Theoretical	Commentary	Causal Factors; Beliefs; Attitude; Performance Related Behaviors; Social & Economic Impact	Research study contributed to the understanding of End User Computer Satisfaction (EUCS) measures.
Moore & Benbasat, 1991	Empirical (Survey)	540 respondents	Voluntariness; Image; Relative Advantage; Compatibility; Ease of Use; Result Demonstrability; Trial Ability; Visibility	Contributed an instrument designed to measure individual perceptions of the adoption of information technology innovations within the organization.
Thompson, Higgins, & Howell, 1991	Empirical (Survey)	212 Respondents from 9 Division in one multi-national firm	Complexity of PC Use; Job Fit with PC Use; Long-term Consequences of PC Use; Affect Toward PC Use; Social Factors Influencing PC Use; Facilitating Conditions for PC Use; Utilization of PCs	Research study contributed to an understanding of social factors, user behaviors, and job fit as factors influencing the use of personal computing devices.
DeLone & McLean, 1992	Theoretical	Commentary	System Quality; Information Quality; Use; User Satisfaction;	Contributed to an understanding of the measures within literature



			Individual Impact; Organizational Impact	that define IS success.
Gist & Mitchell, 1992	Theoretical	Commentary	Internal Self-efficacy Determinants; External Self-efficacy Determinants	Implications of research indicated that an increase in positive beliefs, or a reduction of debilitating beliefs may lead to higher task performance.
Hartwick & Barki, 1994	Empirical (Survey)	127 respondents from 60 organizations	User Participation; User Involvement; User Attitude	Research study suggested that User Participation and User Involvement are two distinct constructs.
Triandis, 1994	Theoretical	Commentary	Social Behavior; Cultural Influences	Study presents a theoretical framework for understanding cultural differences as an influence on human behavior.
Compeau & Higgins, 1995	Empirical (Survey)	1,020 "knowledge workers"	Encouragement by Others; Others Use (of technology); CSE; Expected Outcome; Affect; Usage	Research led to development of 10-item CSE measurement instrument. CSE was validated.
Goodhue & Thompson,	Empirical	600 respondents; 2	Task Characteristics;	Research highlighted the

1995		companies	Technology Characteristics; Individual Characteristics; Task-Technology Fit; Utilization; Performance Impacts	fit between technology and user tasks in individual performance.
Igbaria & Iivari, 1995	Empirical (Survey)	450 users representing 86 Finnish companies.	EOU, Organization Structure, TMS, Usage, CSE	User CSE impacted system usage.
Igbaria, Parasuraman, & Baroudi, 1996	Empirical (Survey)	471 participants representing 62 companies	Skills; Organizational Support; Organizational Usage; Perceived Complexity; Perceived Usefulness; Perceived Fun/Enjoyment; Social Pressure; System Usage	Study determined that perceived usefulness, perceived enjoyment and social pressure had a positive influence on ease of use; perceived usefulness had the strongest direct affect on usage.
Marakas, Yi, & Johnson, 1998	Theoretical	Commentary	Specific Computer Self-efficacy; Specific Computer Performance	Research proffered guidelines for the measurement and manipulation of the CSE construct.
Compeau, Higgins, & Huff, 1999	Empirical (Survey)	2,000 subscribers to a Canadian periodical.	Expectations of Performance; Expectations of Outcome; Personal	Research study confirmed CSE impacts user behavior toward

			Expectations; Affect, Anxiety with Technology; Usage	information technology.
Agarwahl & Karahanna, 2000	Empirical (Survey)	186 University students in a computer science course.	EOU; User Innovativeness; CSE	Study identified CSE as an antecedent (link) to perceived EOU of technology. CSE also influenced User innovativeness with technology.
Alavi & Leidner, 2001	Theoretical	Commentary	Knowledge Concepts	Review and interpretation of KM literature to identify areas of knowledge concepts research.
Adams & Lamont, 2003	Theoretical	Commentary	Organizational KMS Effectiveness; Organization Learning-Based Resources; Capital-Based Firm Resources; Organization Learning Capabilities (Effectiveness); Product and Process Innovation (Competencies); Sustainable Competitive	Research suggested direction in the testing of learning propositions and concepts; stressed importance of separating organizational resources and competencies in innovation activities.

			Advantage	
Havelka, 2003	Empirical (Survey)	324 undergraduate Business majors	Academic Major; Gender; ACT Scores; Income; CSE; Acceptance	Research study theorized on the relationship between user characteristics and CSE. Positive relationship established between EOU and CSE.
Legris, Ingham, & Collerette, 2003	Theoretical	21 TAM Literature Reviews	TAM; EOU; Usefulness; IS Use	Study concluded that TAM is a useful model, and can be related to cultural change.
Ndubisi & Jantan, 2003	Empirical (Survey)	295 small- or medium-size Chinese firms	Computing skills; technical support, Perceive Usefulness; Perceived EOU; Usage	Research study found that computer skills coupled with technical support positively impacted user perception of the usefulness and EOU of information systems.
Venkatesh, Morris, Davis, & Davis, 2003	Theoretical; Empirical (Survey)	Original data drawn from four organizations; then validated by analyzing data drawn from two additional organizations.	TAM; Performance Expectation; Level of Effort Expectation; Social Influence; Facilitating Conditions	Research study described eight models of user acceptance. Key finding was – from a perspective of voluntary versus mandatory

			A critical test of unified theory of acceptance and use of technology was tested across all eight models assessed in the research study.	settings – intention to use varied over time. This was true across all models surveyed.
Gong, Xu, & Yu, 2004	Empirical (Survey)	280 full-time instructors who were pursuing a Bachelor's degree as part-time students	EOU; CSE; Willingness	Research study results consistent with previous research on the TAM. CSE a key determinant (influence) on acceptance.
Hasan & Ali, 2004	Empirical (Survey)	151 participants	CSE; Attitude; Technology Experience	Research study determined that CSE as well as Experience with computer technology influences both user learning performance and computer training.
Hsu & Chiu, 2004	Empirical (Survey)	239 part-time MBA students (University of Taiwan)	Perceived Usefulness; Perceived Playfulness; Perceived Risk; General Internet Self-efficacy; Subjective Norm; Attitude; Perceived Behavioral Control;	Research study empirically validated the Theory of Planned Behavior (TPB).

			Intention; E-service Usage	
Money & Turner, 2005	Empirical (Survey)	51 participants	Perceived usefulness (Usage); Perceived EOU; Attitude toward Use; User Technology Acceptance; Knowledge Management; Residual Knowledge	Research study contributed to understanding TAM as it relates to KMS user acceptance research.
Endres, Endres, Chowdbury, & Alam, 2007	Theoretical	Commentary	Model Knowledge Sharing Behaviors; Persuasion/Praise to Share Knowledge; Opportunity; Attributional Analysis; Self-efficacy	Study presented a theoretical model illustrating how individuals might be motivated to share knowledge.
Lien, Hung, & McLean, 2007	Empirical (Case Study)	12 participants interviewed representing 6 high technology Taiwanese firms	Organization Learning Experience; Organization Learning Implementation; Organization Learning Contributions to Organization performance	Research developed and expanded upon processes and content affecting understanding of organizational learning theory and practice.
Schaper & Pervan, 2007	Empirical (Survey)	483 respondents	Technological Context; Implementation Context; Individual Context;	Preliminary research indicated linkage the dimensions of effort

			Behavioral Intention; Use Behavior	expectancy and compatibility as a determinant of ICT usage; the impact of social influence on usage was minimal.
Levy & Green, 2009	Empirical (Survey)	237 participants (US Navy)	CSE; Perceived Usefulness; Perceived EOU; Attitude; Behavioral Intention (Willingness)	Research study determined that CSE significantly influenced the user's perception of technology usefulness and EOU.

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### *Top Management Support*

Both *social exchange theory* and *agency theory* have been cited in literature examining the top management support – knowledge sharing relationship (Eisenhardt, 1989). Taken as a body of work, the studies encompassed in literature show that top management support likely influences knowledge sharing, as well as the use of KMS (Lewis, Agarwahl, & Sambamurthy, 2003). Connelly and Kelloway (2003) found that top management support was a *key influence* affecting both the level and quality of knowledge sharing within the organization, as well as the organization's commitment to the use of KMS. Lee, Kim, and Kim (2006) as well as Lin (2007b) showed that top management support for knowledge sharing was *positively* associated with knowledge worker's perceptions of the organization being a knowledge sharing culture. Lee et al. (2006) claimed that top management support played a key role in influencing both the

quality and level of employee commitment to knowledge sharing as well as KMS. Cabrera, Collins, and Salgado (2006), as well as Kulkarni, Ravindran, and Freeze (2007) suggested that employee perceptions of the usefulness of knowledge sharing leading to increased knowledge exchange among employees, was a consequence of top management as well as co-worker support.

Of note, King and Marks (2008), who conducted exploratory research in which the effects of *ease of use* and the *usefulness of KMS* were controlled, failed to find a significant effect for perceived organizational support on knowledge sharing. King and Marks (2008) did find, however, that perceived supervisory influence over knowledge sharing through KMS was a *significant predictor* of individual effort related to the frequency of employee contributions to a KMS. Liao (2008) determined that managers perceived by employees as being subject matter experts in their respective knowledge area, as well as empowered to control rewards for employees who exhibited desired behaviors in the workplace, were perceived as being *positively related* to the employee's self-reporting of knowledge sharing activities. Table 12 presents a summary of the literature related to *top management support* as an influence for Analysts to contribute knowledge to a KMS – its findings and contributions.

Table 12. Summary of Literature – Top Management Support as an Influence for Analysts to Contribute Knowledge to a KMS.

<b>Study</b>	<b>Methodology</b>	<b>Sample</b>	<b>Instrument / Construct</b>	<b>Main Findings or Contributions</b>
Eisenhardt, 1989	Theoretical	Commentary	Agency Theory is revolutionary; Agency Theory addresses no clear problem	Summary of Agency Theory studies.



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Crowe, Fong, Bauman, & Zayas-Castro, 2002	Empirical (Survey)	7 respondents (Organizations)	BPR Effort; Egalitarian Leadership; Working Environment; Top Management Commitment; Managerial Support; Employee Resistance	Development of a tool designed to quantitatively estimate the potential risk level of a proposed business process reengineering initiative before the organization commits resources to the effort; BPRs generally have a high failure rate.
Lewis, Agarwahl, & Sambamurthy, 2003	Empirical (Survey)	161 respondents	Institutional Factors; Social Factors; Individual Factors; Perceived Usefulness; Ease of Use	Study found that employee Ease of Use beliefs were positively influenced by top management commitment.
Connelly & Kelloway, 2003	Empirical (Survey)	126 respondents from 4 Canadian universities	Knowledge sharing; Social interaction culture; Management's support for knowledge sharing; Available technology; Gender; Age; Organizational size; Tenure	Study confirmed perceptions of positive social interaction coupled with management's support for knowledge sharing would portend a knowledge sharing culture.
Cabrera, Collins, &	Empirical (Survey)	372 participants	Person; Environment;	Research study showed

Salgado, 2006			System	participation in knowledge sharing is a function of psychological variables, perceptions of the organizational environment, and perceptions of KMS.
Lee, Kim, & Kim, 2006	Empirical	356 participants from 42 organizations	Reward; Top Management Support; IT Service Quality; Learning Orientation; Trust; Employee Commitment; Knowledge Quality; Knowledge Sharing Level	Study determined that Top Management Support significantly affected the organizational climate maturity for KM; organizational climate maturity assured high quality organizational knowledge and knowledge sharing.
Lin, 2007b	Empirical (Survey)	172 participants from 50 organizations in Taiwan	Individual factors; Organizational factors; Technology factors; Knowledge sharing processes; Firm innovation capability	Research study showed that Top Management Support significantly influences knowledge sharing within the organization; Top

				Management Support also results in improved innovation capability for the organization.
Kulkarni, Ravindran, & Freeze, 2007	Empirical (Survey)	150 knowledge workers	Organizational Support; Knowledge Content Quality; KMS Quality; Perceived Usefulness of Knowledge Sharing; User Satisfaction; Knowledge Use	Study identified organizational dimensions and measures that enable knowledge sharing and reuse; integrated approaches from social, organizational, and economic theories.
King & Marks, 2008	Empirical (Survey)	Single Federal Agency; 169 respondents	Supervisory Control; Organization Support; Sharing Frequency; Sharing Effort	Study reflected that Top Management Support is the most important factor for encouraging knowledge sharing within the organization.
Liao, 2008	Empirical (Survey)	105 respondents representing 8 Taiwanese companies	Coercive Power; Expert Power; Knowledge Sharing; Legitimate Power; Reference Power; Reward Power; Social	Research study examined the impact of the manager's social power on the knowledge sharing behavior on a group of R&D employees.

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### IS, Economics, and Behavioral Sciences Theories

In the review of the literature supporting the research model in this study, a number of IS, economics, and behavioral sciences theories supporting IS research have been advanced. Gregor (2006) described *Theory* as “building blocks encompassing the necessary components and means of representation, constructs, relationships between the constructs” (p. 634). Gregor (2006) also argued that the components of the theory might vary based upon the nature of the theory including “causally based explanations” (p. 634). Theories are very useful because they facilitate the collection of knowledge in a disciplined and systematic manner. A number of different views have been advanced with respect an all-encompassing definition for IS Theory (Gregor, 2006). At the core of any generally accepted theory are the tenets of abstraction, a generalization about the phenomenon under study, interactions, and causation (Lee & Baskerville, 2003; Popper, 1980; Neuman, 2000; Sutton & Staw, 1995). As stated by Lewin (1945) “nothing is so practical as a good theory” (p. 129). Thinking clearly about the nature of the theories supporting this research study has significance for both research and practice.

Theory	References	Definitions
Agency Theory	Fishburn, 1970 Alchian & Demsetz,	The ubiquitous relationship in which one party (the principal) delegates work to another (the agent), who performs the work.

	1972	
	Eisenhardt, 1989	
	Chen, Wu, & Cheng, 2013	
Attribution Theory	Kelley, 1967 Tomlinson & Mayer, 2009  Weiner, 1974	Explains how individuals interpret events and how that interpretation subsequently affects their behavior and decision-making. Positive outcomes reinforce trusting beliefs; negative outcomes decrease some aspects of trustworthiness.
Contingency Theory	Balkin, Gomez- Mejia, 1987  Donaldson, 2001	Contingency theories hold that “there is a fit the organizational structure and the contingency that has a positive effect on performance” (Donaldson, 2001, p. 10).
Organizational Support Theory	Eisenberger et al., 1986  Eisenberger et al., 1997  Rhoades, Eisenberger, & Armeli, 2001  Rhoades & Eisenberger, 2002	Organizational support theory “supposes that employees personify the organization, infer the extent to which the organization values their contributions and cares about their well-being, and reciprocate such perceived support with increased commitment, loyalty, and performance. On the basis of these assumptions, organizational support theory provides a general approach to the role of the reciprocity norm in employee–employer relationships” (Rhoades & Eisenberger, 2002, p. 711-712).
Self-efficacy Theory	Bandura, 1986  Bandura, 1997	An individual’s perception of his/her ability to organize and execution actions necessary to achieve a specified performance level in specified tasks.

	Compeau, Higgins, & Huff, 1999	
Social Cognitive Theory	Bandura, 1986  Davis, 1989 Compeau & Higgins, 1995	Posits individual self-perception of efficacy (ability) as a key determinant in an individual's skills acquisition and task performance (Bandura, 1986). Describes human behavior as the interaction between environmental factors, personal factors, and behaviors.
Socio-Economic Theory	Smelser & Swedberg, 2005	Contends that individuals would behave in a manner consistent with the promotion and realization of self-interests.
Social Exchange Theory	Emerson, 1962  Blau, 1964  Orlikowski & Robey, 1991  Gulati, 1995  Byers & Wang, 2005	Is focused on the behavior of the individual, and the interpersonal network that exists between individuals. The underlying principle of the social exchange framework is that "each party in a dyad exchanges in a diverse set of exchanges to influence each other and attain the most favourable outcomes – that is, to maximize rewards and minimize costs" (p. 204) (Byers & Wang, 2005).
Theory of Reasoned Action	Fishbein & Ajzen, 1975  Sheppard, Hartwick, & Warshaw, 1988	Assumes that human beings are rational and make systematic use of the information available to them. TRA is widely accepted in social psychology to explain virtually any human behavior
Utility Theory	Aleskerov & Monjarett, 2002	

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Coase, 1937	An individual's preference when, as a decision maker, s/he must select one alternative (act, course of action, strategy) from a recognized set of decision alternatives when the outcome of that selection is unknown. Utility theory provides a structured approach supporting the evaluation of alternative choices made by individuals, firms and organizations. Utility measures each choice for the satisfaction it provides to the decision maker. Utility theory assumes that all decisions are made based on the utility maximization principle, in which the best choice is the one that provides the highest utility (satisfaction) to the decision maker.
Fishburn, 1970	
Becker, 1976	
Keeney & Raiffa, 1993	
Starmer, 2000	
Hammond, Keeney, & Raiffa, 2002	

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**Table 13.** Information Systems, Economics, and Behavioral Sciences Theories supporting research.

### **Summary of What is Known and Unknown in Research Literature**

#### *What is Known in Research Literature*

This research literature review has established relevant content pertaining to the theories and constructs presented in study's model. In providing relevant theoretical foundations for this study, this research literature review has drawn from a number of fields of study including IS, organizational, economics, as well as the social sciences fields of study. Within IS literature, it has been established that data, information, and knowledge are not interchangeable terms (Stenmark, 2001). Nonaka (1994) argued that knowledge and information are similar in some respects, but different in others. Earl and Scott (1998) suggested that knowledge is more complex, subtle, and multivariate than

information. Dougherty (1999) submitted that information only becomes valuable when it is combined with personal experience. Schultze and Stabell (2004) noted that a “complete and agreed upon definition of knowledge remains elusive (p. 551).

Research literature has shown knowledge, within successful (effective & productive) organizations, exists as a commodity; a commodity that can be created, captured, imparted, shared and leveraged (Brynjolfsson, 1994; Gold, Malhotra, & Segars, 2001). Polyani (1996) realized that knowledge exists in two forms: (1) explicit knowledge that is relatively easy to codify and can be shared asynchronously; as well as, (2) tacit knowledge that is experiential and most often exchanged through face-to-face encounters. According to Zack (1999), explicit knowledge is relatively easy to identify and quantify. Notably, explicit knowledge also lends itself to dissemination and knowledge sharing through supporting organizational information technology systems (Kühn & Abecker, 1997). In isolation, however, explicit knowledge alone does not make for an effective and productive organization (Smith, 2001; Wyatt, 2001). Analogous to an iceberg, the tacit (unrecorded) knowledge obtainable within an organization is barely visible. Bhardwaj and Monin (2006) estimated that some 90% of an organization’s tacit knowledge is hidden (contained solely in the minds of the employees) ‘below the waterline.’ Literature has shown the essence of an effective and productive organization lies in its tacit (implicit) knowledge (Polyani, 1966; Bhardwaj & Monin, 2006).

Knowledge, research literature has argued, is actionable information (Chan & Chau, 2005; Stein, 2005). Because tacit knowledge resides within the mind of the individual, research has shown knowledge to be unique - closely to an individual’s senses and previous experiences (von Krogh, 1998). For knowledge to provide an organization



with a sustainable competitive advantage, that knowledge must be captured (harvested) from the employee and stored in a KMS (p. 2) (Myer, 1996). Yet, as Nonaka (1994) asserted, “these perspectives remain personal unless they are articulated and amplified through social interaction” (p. 22). Once harvested, knowledge – through knowledge sharing facilitated by a technology-based KMS – can be leveraged to improve an organization’s effectiveness and productivity (Davenport, DeLong, & Beers, 1998; Stein, 2005).

Literature defining KM as a field of study is both scattered and wide-ranging (Raghu & Vinze, 2007). Within literature, KM has generally been defined as the ability to create, acquire, organize, share, and transfer knowledge (Wiig, 1993). Literature argues KM – as art and practical discipline – seeks to accomplish two goals: (1) in practice, KM efficiently manages the pool of available knowledge; and, (2) in practice, KM facilitates the creation of new knowledge (Hendriks & Vriens, 1999). As asserted by Nissen (2006), the focus of the first goal is to get the right knowledge, to the right person or place, at the right moment in time. This literature-based argument would suggest that knowledge could be contained, manipulated, and leveraged by a technology-based solution such as a KMS (Subramanian & Soh, 2009). The focus of the second goal suggests that conditions can be established (i.e., collaborative environment) that would both foster and nurture the prospects of knowledge creation (Alavi & Leidner; Hendriks & Vriens, 1999). As consistently cited within literature, in an organization that collaborates successfully, learning – and a learning organization – will result (Hendriks & Vriens, 1999).

Within literature – and foundational to this research study – KM has been described as the process of capturing, distributing, and effectively sharing knowledge within the organization (Davenport & Prusak, 1998). Key to effective knowledge sharing, Davenport and Prusak (1998) asserted that a knowledge-based culture is established and nurtured by inculcating desirable behaviors fostering as well as supporting knowledge sharing. As affirmed within literature, the primary goal of knowledge management is to help organizations not only change but, to change faster to keep pace with the ever-changing environment (Flynn, Pottinger, & Batchelor; Schein, 1985).

Published research has consistently cited the importance of information technologies as a means by which users gain access to the most timely and relevant information while simultaneously capturing as much information as feasible – contributing to the organization's body of knowledge (Alavi & Leidner, 1999; Marwick, 2001). To reap the knowledge sharing benefits derived from a KMS, McDermott (1999) and Zack (1999) noted that social barriers to be overcome loom as large as the technical barriers. Notably, Bjoern (1998) as well as Ruppel and Harrington (2001) argued that sophisticated technology-based solutions – while important – are no guarantee of success in knowledge sharing initiatives with social interactions assuming a contributory role in the knowledge sharing endeavor.

Aspects of literature have argued that a lack of inducements (incentives) have proven to be a barrier to knowledge sharing across cultures (Yao, Kam, & Chan, 2007). Hansen, Nohria, and Tierney (1999), Liebowitz (2003), as well as Nelson, Sabatier, and Nelson (2006) contended that incentives – encompassing recognition and rewards as interventions – serve to facilitate knowledge sharing as a means to building a supportive

culture. Based upon *social exchange* and *social capital theories*, organizational awards like promotions, bonuses, and salary increases have shown to be *positively related to the frequency of knowledge contribution to a KMS*, more so when the knowledge workers identify with their organization (Kankanhalli et al., 2005; MacInnis, Moorman, & Jaworski, 1991). Research argues that those knowledge workers who perceive a greater likelihood of receiving incentives through the use and sharing of the KMS are more likely to report its content as being useful (Cabrera, Collins, & Salgado, 2006; Kulkarni, Ravindran, & Freeze, 2007). Conspicuously, Quigley, Tesluk, Locke, and Bartol (2007), as well as Taylor (2006) posited that group-based incentives had a greater positive influence on knowledge sharing than individual-based incentives.

Conversely, the empirical results of research studies examining the positive influence extrinsic rewards would have on knowledge sharing has been mixed. Bock and Kim (2002), as well as Bock, Zmud, Kim, and Lee (2005) determined that extrinsic rewards had a negative effect on knowledge workers attitudes toward knowledge sharing and KMS. Studies conducted by Kwok and Gao (2005), Lin (2007a), as well as Lin (2007b) discovered that no relationship existed between extrinsic motivations and knowledge sharing or attitudes toward knowledge sharing. Chang, Yeh, and Yeh (2007) demonstrated that outcome-based rewards, as well as awards for effort, did little to foster knowledge sharing between team members. Studies conducted by Kwok and Gao (2005), Lin (2007a), as well as Lin (2007b) discovered that no relationship existed between extrinsic motivations and knowledge sharing or attitudes toward knowledge sharing. Chang, Yeh, and Yeh (2007) demonstrated that outcome-based rewards, as well as awards for effort, did little to foster knowledge sharing between team members.

Literature describes the inducement centrality, as the degree to which one believes s/he can establish oneself in a position of influence because of knowledge contributions to the organization (Astley & Sacdeva, 1984; Pfeffer, 1981; Yli-Renko, Autio, & Sapienza, 2001). Bolino (1999) asserted employees might choose to engage in knowledge sharing as a means to developing personal relationships with peers or, to simply manage their impression on others. Centrality is a function of an employee's connectedness (position of influence) to other sources of power within the organization: people, information, and other resources (Pfeffer, 1981). Significantly, Wofford (1971) asserted that a knowledge provider who is engaging in knowledge sharing does so for the expressed purpose of influencing management policy or organizational politics, does so at the risk of being viewed unfavorably by others who will be less likely to reciprocate in knowledge sharing activities. Centrality and power – as inducements – are inextricably linked (Subramanian & Soh, 2009). Literature has suggested that a change in an employee's connectedness to these sources of power will, by necessity, dictate a change in the employee's centrality (position of influence) within the organization (Burkhardt & Brass, 1990).

Within literature, a definitive understanding of the concept of power remains elusive (Bachrach & Baratz, 1962). Kankanhalli, Tan, & Wei (2005) described power as the ability or the right to control people and/or things. When exercised as a source of individual power and superiority, knowledge can be an inhibitor (Gupta & Govindarajan, 2000; Mulder, 1971; Orlikowski, 1993). Husted and Machilova (2002) determined that knowledge sharing could be adversely affected in situations wherein employees realize that by not sharing knowledge they can favorably influence their own rewards system

(e.g., promotion, pay, extended job assignments, & employment retention). As shown by Kim and Mauborgne (1998), as well as Szulanski (1996), knowledge sharing leading to a promotion of the common good for all employees as well as the organization, becomes a disincentive, because the distinctiveness of each employee is lost. Additionally, these concerns may be exacerbated by the use of KMS because its contributions are recorded and are generally made available to all users even those who have not made a contribution to the system (Fehr, Holger, & Wilkening, 2013; Wasko & Faraj, 2000). Astley and Sachdeva (1984), Liao (2008) as well as Renzl (2008) examined the need to provide incentives to motivate knowledge workers to share their knowledge, but also suggested the need for further research knowledge sharing from a power perspective.

In literature, trust, as a concept, does not have a universally accepted definition (Barber, 1983; Das & Teng, 2004; Kee & Knox, 1970, McKnight & Chervany, 2002; Rousseau, Sitkin, Burt, & Camerer, 1998). Holzner (1973), Williams (2001), and Zand (1972) described trust as a person's willingness to depend on another individual's actions that involve opportunism. Literature generally showed a *positive*, interpersonal trust-knowledge sharing relationship. Trusting an individual means "the probability that he (or she) will perform an action that is beneficial or at least not detrimental to us is high enough for us to consider engaging in some form of cooperation with him (or her)" (Gambetta, 1988, p. 217). From literature, two streams of conceptualization concerning a definition of trust emerge. The first centers on *trust as an expectation* of an interacting partner (Barber, 1983; Koller, 1988; Luhmann, 1979; Rotter, 1967). The second focuses on *associating trust with an acceptance of and exposure to vulnerability* (Doney, Cannon, & Mullen, 1998; Mayer, Davis, & Schoorman, 1995; Rousseau et al., 1998; Zand, 1972).

Søndergaard, Kerr, and Clegg (2007) showed that trust could be a double-edged sword. Trust is the key enabler in knowledge sharing between individuals in an organization (Bartol & Srivastava, 2002, Das & Teng, 2001; von Krogh, Roos, & Kleine, 1998).

Baier (1986) as well as Hosmer (1995) found that an organization's reputation stems from its trustworthy behaviors. Trust is a function of trustworthiness, based on referrals or ratings from members in a community (Jøsang, Ismail, & Boyd, 2007). Trust is also an indication of an individual's (or collectively an organization's) credibility, which is the result of a comparison between what the individual (or organization) promises and what s/he (it) actually delivers (Casalo, Flavian, & Guinaliu, 2007; Jones & George, 1998; Knights, Noble, Vurdubakis, & Willmott, 2001; Xu, Kim, & Kankanhalli, 2010).

According to Tyler and Kramer (1996), trust is based on an individual's "estimation of the probability that those trusted will reciprocate the trust" (p. 10). Some people are more trusting than others (Lewicki, McAllister, & Bies, 1998; Mayer, Davis, & Schoorman, 1995; McEvily, Perrone, & Zaheer, 2003). Research literature reflects a substantial variation in the propensity and density of trust one is willing to extend to another occurs because of the systemic nature of human personalities (Das & Teng, 2004; Luhmann, 1979; Rotter, 1980). This readiness to trust varies not only from one person to another, and from situation to situation (Worchel, 1979; Powley, 2009). Koller (1988) as well as Lewis and Weigert (1985) asserted that the risk determines the level of trust. Mayer, Davis, and Schoorman (1995) presupposed that trust is an antecedent to risk-taking. Kee and Knox (1970) determined that even when risks were negligible, trust was necessary as long as betrayal was a possibility. Moreover, risk is critical in the building

of trust since trust would not be necessary if actions could be pursued with absolute certainty (Lewis & Wiegert, 1985).

Amabile, Patterson, Mueller, Wojcik, Odomirock, and Marsh (2001) described collaboration as the process of “individuals who differ in notable ways sharing information and working towards a particular purpose” (p. 419). Ariño and de la Torre (1998), Crowe, Fong, and Zayas-Castro (2002) as well as Weick and Roberts (1993) stressed that a cooperative (collaborative) environment is one of the critical success factors in KM initiatives. Sonnenwald (2007) as well as van den Hooff, Schouten, and Simonovski, (2012) emphasized the social context of collaborations. A cooperative environment, with friendly interaction in which people work in teams, has a chance of improving performance and productivity (Green & Roseman, 2000; Marir & Mansar, 2004; Tatsiopoulos & Panayiotou, 2000; Zolin & Hinds, 2004). As postulated in literature, Stein and Zwass (1995) as well as Mudambi and Helper (1998) argued that for shared knowledge to be used meaningfully, the knowledge needed to be coupled with mechanisms supporting the organization, retention, maintenance, as well as the search and retrieval of the knowledge. Literature has also identified an abundance of individual, technology, group process, and organizational factors impacting the use, re-use, and sharing of knowledge (Rice & Gattiker 1999; Sambamurthy & Chin 1994). Ultimately, knowledge workers seek to share knowledge to facilitate learning (Wasko & Faraj, 2000).

Research literature focused on employee resistance to sharing has shown that minority status or diversity in team members can be a factor in knowledge sharing (Cummings, 2004). Ojha (2005) suggested that team members who thought of themselves as being in the minority based upon gender, marital status, or education were

less likely to share knowledge with other team members. Studies conducted by Phillips, Mannix, Neale, and Gruenfeld (2004), as well as Thomas-Hunt, Ogden, and Neale (2003) showed that socially isolated members of a team were more likely to disagree with other team members, while also being less likely to contribute their unique knowledge within the context of a heterogeneous team. Dweck and Leggett (1988) determined that high performing, goal oriented knowledge workers were more concerned about demonstrating their competence – performing effectively while avoiding risks and negative judgments – than they were with knowledge sharing. Paradoxically, high-performing knowledge workers believed that knowledge sharing detracted from the time and effort available for work activities that could result in their receiving greater personal benefits and rewards (Husted & Michailova, 2002; Szulanski, 1996; Zand, 1972).

Research contributions focused on organization structure revealed that employees who are emotionally committed to the organization demonstrated heightened job performance, reduced absenteeism, and are less likely to quit their job (Mathieu & Zajac, 1990; Mowday, Porter, & Steers, 1982). In contrast, research conducted by Meyer & Allen (1997) suggested that employees are more concerned with the organization's commitment to them. Employment, as defined within literature, is the reciprocal exchange of an employee's effort and loyalty for tangible benefits as well as social rewards (Bateman & Organ, 1983; Brief & Motowidlo, 1986; Etzioni, 1961; Gould, 1979; Levinson, 1965; March & Simon, 1993; Mowday et al., 1982; Organ & Konovsky, 1989; Steers, 1997). According to the research of Eisenberger et al., (2001), it holds true that employees perceptions of support from an organization will provide them with pathways to remuneration by acting in ways valued by the organization. To an employee,



being valued by an organization suggests approval and respect, as well as the rewards of pay and promotion (Shore & Shore, 1995). Being valued by the organization can also provide the employee entrée to information and other resources needed to succeed in the workplace (Astley & Sachdeva, 1984; Mowday, Porter, & Steers, 1982). Research posits that a strong relationship exists between organizational support and knowledge sharing, Studies offered by Rousseau (1995), Shore and Barksdale (1998), as well as Tsui, Pearce, Porter, and Tripoli (1997) cautioned that other undercurrents exist that may modify or undermine the nature or capacity of the connection. Of importance here is the unbalanced relationship in which employer proffered inducements directed toward the employee, do not match the desired or needed interests of the employee. This “underinvestment” in the employees may influence knowledge sharing within the organization (Tsui, et al., 1997, p. 1093). Research in organizational support theory, encapsulating the crux of this challenge, postulates that by creating a sense of obligation within the individual, the organization impacts the employee’s sense of reciprocity – creating attitudes and behaviors resulting in reciprocation (Eisenberger et al., 1986; Gouldner, 1960).

Within the context of this study, the use of KMS draws upon three complementary streams of research: *Computer Self-Efficacy (CSE)* – defined as an individual’s belief in his/her ability to use computers in the determination of computer use when faced with a new or unfamiliar situation; *Task-Technology Fit (TTF)* – defined as a technology providing features that support or ‘fit’ the requirements of the task; and, *User Attitudes Toward Technology* (Compeau & Higgins, 1995; DeLone & McLean, 1992; Goodhue & Thompson, 1995; Igbaria, Parasuraman, & Baroudi, 1996; Legris, Ingham, & Collette, 2003; Smith, Caputi, Crittenden, Jayasuriya, & Rawstorne, 1999).

While each of these perspectives gives insight into the impact on a knowledge worker's use of information technology, each alone has important limitations.

Compeau, Higgins, and Huff (1999) have defined *self-efficacy* as an individual's perception of his/her ability to organize and execution actions necessary to achieve a specified performance level in specified tasks (Compeau et al., 1999). As a concept addressed in literature, *self-efficacy* is fixed in Bandura's (1986) *Social Cognitive Theory (SCT)*. SCT describes human behavior as the interaction between environmental factors, personal factors, and behaviors (Compeau & Higgins, 1995; Gong, Xu, & Yu, 2004). In summary, an individual with a high-level of self-efficacy is likely to expend more effort, and be more persistent in working toward a goal than someone with a lower sense of self-efficacy (Gist & Mitchell, 1992).

As a concept, CSE developed from the literature on self-efficacy (Compeau & Higgin, 1995; Smith, Caputi, Crittenden, Jayasuriya, & Rawstorne, 1999). Compeau and Higgins (1995) defined CSE as "a judgment of one's ability to use a computer" (p. 192). Further, research conducted by Marakas, Yi, and Johnson (1998) suggested that those individuals who placed greater stock in their CSE beliefs, were more likely to report higher perceptions of usefulness, as well as ease of use. With respect to this study, Marakas et al. (1998) discovered further that CSE *positively influences* beliefs about the use of information systems. Previous literature has pointedly discussed how CSE affects the use of technology in the workplace resulting in increased user productivity, job performance, and effectiveness (Marakas et al., 1998; Havelka, 2003; Ndubisi & Jantan, 2003). Identifying the determinants of such acceptance, however, has proven to be the

more challenging task (Igarria & Iivari, 1995; Levy & Green, 2009; Money & Turner, 2005; Venkatesh, Morris, Davis, & Davis, 2003).

An individual's use of a particular information technology is not always a matter of choice (Goodhue, 1986). Goodhue and Thompson (1995) determined that in many cases, the 'choice' of the information technology in use is a function of the design of a user's job, rather than the quality or usefulness of the technology employed, or the attitude of the knowledge worker employing the technology. To the extent that a technology is used – since its use is not voluntary – will depend increasingly on *task-technology fit* rather than use (DeLone & McLean, 1992). There is also explicit recognition that increased use of a system does not necessarily equate to a higher performance level (Pentland, 1989).

A key concern in the information systems research has been gaining a better understanding of the linkage between information technology and individual performance (Cheney, Mann, & Amoroso, 1986; Davis, 1989; Davis, Bagozzi, & Warsaw, 1989; Doll & Torkzadeh, 1991; Lucas, 1975, 1981; Robey, 1979; Swanson, 1982, 1987; Thompson, Higgins, & Howell, 1991). Much of the research in literature is based on theories of attitudes and behaviors (Bagozzi, 1981, 1982; Fishbein & Ajzen, 1975; Triandis, 1994). Aspects of the technology (e.g., high quality, intuitive systems) lead to user attitudes (e.g., beliefs, affects) about a system's usefulness (Lucas, 1975; Agarwahl & Karahanna, 2000). Attitudes, cultural norms, as well as other situational factors, promote a user's intention to use a KMS (Hartwick & Barki, 1994; Moore & Benbasat, 1992). If a user perceives that a KMS does not benefit his/her job, s/he will regard the KMS as useless, and as a result will not use the system (Adams & Lamont, 2003).

Both *social exchange theory* and *agency theory* have been cited in literature examining the top management support – knowledge sharing relationship (Eisenhardt, 1989). Taken as a body of work, the studies encompassed in literature show that top management support likely influences knowledge sharing, as well as the use of KMS (Lewis, Agarwahl, & Sambamurthy, 2003). Connelly and Kelloway (2003) found that top management support was a *key influence* affecting both the level and quality of knowledge sharing within the organization, as well as the organization's commitment to the use of KMS. Lee, Kim, and Kim (2006) as well as Lin (2007b) showed that top management support for knowledge sharing was *positively* associated with knowledge worker's perceptions of the organization being a knowledge sharing culture. Lee et al. (2006) claimed that top management support played a key role in influencing both the quality and level of employee commitment to knowledge sharing as well as KMS. Of note, King and Marks (2008), who conducted exploratory research in which the effects of *ease of use* and the *usefulness of KMS* were controlled, failed to find a significant effect for perceived organizational support on knowledge sharing. King and Marks (2008) did find, however, that perceived supervisory influence over knowledge sharing through KMS was a *significant predictor* of individual effort related to the frequency of employee contributions to a KMS.

#### *What is Unknown (Knowledge Gaps) in Literature*

To be credible, KMS (knowledge sharing) research and development should preserve as well as build upon the significant literature that exists in different but related fields (Stein & Zwass, 1995; Kühn & Abecker, 1997). The focus of this study is to address the question, 'Does the supporting KMS motivate an individual to provide

knowledge for sharing' (Hendricks, 1999; Pee, Kankanhalli, & Hee-Wong, 2010; Tissen, Andriessen, & Lekanne Deprez, 2000)? Within the IC operational environment, providing a tangible solution to that question is the critical requirement (Flynn, Batchelor, & Pottinger, 2010).

Equally important are the literature knowledge gaps that would be mitigated by this research study. Within literature, there is the assumption that knowledge harvesting, as well as knowledge sharing, will occur naturally and automatically as a consequence of the knowledge harvesting processes, collaborative processes, as well as KMS technologies being in place (Kankanhalli et al., 2005). This study proposes that once the human element is introduced into the equation, this assumption becomes improbable (Heiman & Nickerson, 2004; van den Hooff, Schouten, & Simonovski, 2012).

This research study sought to define better the concept of willingness, which is difficult to isolate within literature (May, Gilson, & Harter, 2004). This quandary exists because the definition of willingness, within literature, is generally taken for granted and – when discussed – is normally context specific (Kahn, 1990; May, Gilson, & Harter, 2004). Of import to this research study, willingness is a “multi-dimensional construct”, meaning it is a property that can be influenced (Héliot & Riley, 2010, p. 402).

Although considerable management practice literature has been published focused on incentives introduced into a collaborative environment structured to motivate knowledge workers to share knowledge, a definitive knowledge gap exists with respect to inducements used in support of the use of KMS (Huber, 2001; Osterloh & Frey, 2000). Knowledge management literature is also replete with research conducted in the use of motivators (e.g., rewards & incentives) to encourage knowledge sharing (Bartol &

Srivastava, 2002; Kankanhalli et al., 2005; Subramanian & Soh, 2009). A closer examination of the results published in literature underscores the indeterminate value that motivators have – as causal factors – underpinning a knowledge worker’s motivation for contributing to knowledge sharing through a KMS (Balkin & Gomez-Mejia, 1987; Shin, 2004; Simonin, 1999; Spender & Grant, 1996).

### **Summary**

Drawing from the fields of quality research literature encompassing IS, organizational, economics, as well as the social science fields of study, this chapter provides important theoretical foundations for this research study. The key factors relating to the research model constructs in literature have been synthesized to form the conceptual framework that would be introduced by this study. This literature-based conceptual framework provides the theoretical foundations for an empirical assessment of the impact of the factors of *reward, power, centrality, trust, collaborative environment, resistance to share, ease-of-using KMS, organizational structure, and top management support to inducement, willingness to share*, as well as *opportunity* to contribute knowledge to a KMS on knowledge-sharing in a highly classified and sensitive environment of the USG IC. This chapter provided a quality research literature-based summary addressing each of the 15 constructs advanced in the study’s conceptual model.

Building upon the impact of the *inducement* and *opportunity* factors encompassed within the Subramanian and Soh (2009) theoretical model, this chapter provides a literature-based review of each of the inducements as well as opportunity factors influencing an individual’s *willingness to share* in contributing knowledge to a KMS

(Boland et al., 1994). In this chapter, a new set of constructs focused on an intelligence analyst's willingness to contribute knowledge his/her knowledge to a KMS received an in-depth review based upon quality research (Devaraj & Kohli, 2003; Faniel & Majczak, 2002). The new constructs introduced in this research study are: the degree or measure of *Trust* imbued in the KMS, the creation and sustainment of a *Collaborative Environment*, and an examination of an analyst's *Resistance to Share* in a collaborative environment supported by KMS (Burkhardt & Brass, 1990; Constant et al., 1996).

This chapter also provided a literature-based review of each of the ten theories foundational to the 15 constructs presented in this study: Agency Theory, Attribution Theory, Contingency Theory, Organizational Support Theory, Self-efficacy Theory, Social Cognitive Theory, Socio-economic theory, Social Exchange Theory, and the Theory of Reasoned Action. Each of these theories and associated constructs serve to address the the main research question of this research study: What is the impact of the factors of *reward, power, centrality, trust, collaborative environment, resistance to share, ease-of-using KMS, organizational structure, and top management support to inducement, willingness to share*, as well as *opportunity* to contribute knowledge to KMS on knowledge sharing in a highly classified and sensitive environment?

The last sections of this chapter conclude with a quality, literature-based, synthesized review of what is known in literature. This literature-based review of "what is known" is immediately followed by a synthesized assessment of "what is unknown." Finally, the focus of this research study is addressed – bridging and closing the knowledge gaps presented within the context of this research study.

## Chapter 3

### Methodology

#### **Research Methodology/Design**

This study is a confirmatory as well as empirical investigation examining the challenge of maintaining strong organizational effectiveness and productivity using KMS (Beer & Nohria, 2000). This study builds upon the impact of the *inducement* factors encompassed within the Subramanian and Soh (2009) theoretical model, the constructs of *reward, power, centrality, organizational structure, and top management support*. This study also examines the *opportunity* to influence same, as well as assesses their impact on an individual's *willingness to share* knowledge for the purpose of establishing KMS in a highly classified and sensitive operational environments (Boland et al., 1994).

#### **Specific Research Method Employed**

This study used a quantitative anonymous survey methodology through a Web-enabled survey instrument. A survey was used to collect data for testing the research propositions. This methodology was selected because it enhanced the generalizability of the results (Dooley, 2001). Making the survey instrument supporting this study available to other researchers facilitates three outcomes related to the generalizability of the results. First, it allows researchers to make time- and place-specific observations, thereby increasing confidence in the findings starting with the testing of the model offered in this study. Second, it allows other researchers to move from *observations* to ascribing confidence in the theories and propositions presented in this study. Third, using



appropriate quantitative analysis tools, the methodology and findings of this study may be used to make predictions based upon recurring experience (Best, Krueger, Hubbard, & Smith, 2001).

This study's anonymous survey instrument was distributed – via a commercial Website – to a select group of Intelligence Analysts (respondents) assigned to specific Intelligence Operations-centric departments and agencies within the USG. Survey respondents were notified of the Website (& the appropriate Website survey URL/link) by their colleagues using professional social networking and were asked to complete the survey on their personal time. Survey participant notifications were made based upon Institution Review Board (IRB) approval of this study by Nova Southeastern University, as well as by the IRB approval authorities of the various participatory activities, agencies, and organizations.

The specific research propositions addressed in this study were (See Figure 2):

P1a: An employee's perceived *reward* will demonstrate a significant positive influence on his/her *inducement* to contribute knowledge to the KMS.

P1b: An employee's perceived increase in *power* within the organization will demonstrate a significant positive influence on his/her *inducement* to contribute to the KMS.

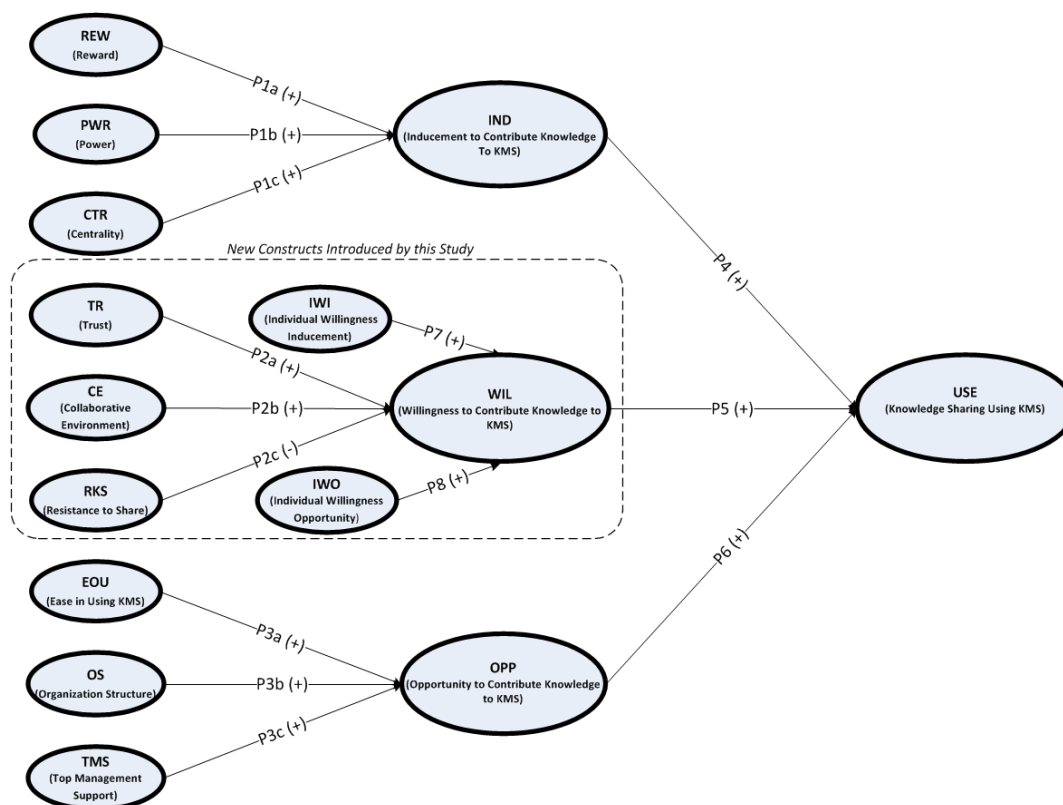
P1c: An employee's perception of increased *centrality* within the collaborative hierarchy will demonstrate a significant positive influence on his/her *inducement* to contribute to the KMS.

- P2a: An employee's perceived *trust* in a collaborative environment will demonstrate a significant positive influence on his/her *willingness* to contribute knowledge to the KMS.
- P2b: An employee's perceived value of a *collaborative environment* within the organization will demonstrate a significant positive influence on his/her *willingness* to contribute to the KMS.
- P2c: An employee's perceived *resistance to share* within a collaborative environment will demonstrate a significant negative influence on his/her *willingness* to contribute to the KMS.
- P3a: An employee's perceived *ease of use* in the supporting technology within the collaborative environment will demonstrate a significant positive influence on his/her *opportunity* to contribute knowledge to the KMS.
- P3b: An employee's perceived value of a *supportive organization structure* will demonstrate a significant positive influence on his/her *opportunity* to contribute to the KMS.
- P3c: An employee's perceived value *top management support* of the collaborative environment by will demonstrate a significant negative influence on his/her *opportunity* to contribute to the KMS.
- P4: An employee's *inducement* to contribute knowledge to the KMS will demonstrate a significant positive influence on his/her knowledge sharing using KMS.
- P5: An employee's *willingness* to contribute to the KMS will demonstrate a significant positive influence on his/her knowledge sharing using KMS.

P6: An employee's *opportunity* to contribute to the KMS will demonstrate a significant positive influence on his/her knowledge using KMS.

P7: An employee's *individual willingness inducement* to contribute to the KMS will demonstrate a significant positive influence on his/her *willingness* to contribute knowledge to the KMS.

P8: An employee's *individual willingness opportunity* to contribute to the KMS will demonstrate a significant positive influence on his/her *willingness* to contribute knowledge to the KMS.



**Figure 2:** The Inducement-Willingness-Opportunity Framework on the Use of KMS by Knowledge Contributors

## **Instrument Development and Validation**

According to Straub (1989), confirmatory empirical research will be strengthened when validation of the instrument used to test the validity of the research constructs occurs (Straub, 1989). This research study capitalized on survey items to measure the constructs adapted from three previously validated studies conducted by Chowdbury (2005), Kankanhalli et al. (2005), as well as Subramanian and Soh (2009). As observed by Blalock (1979), a number of the constructs advanced in the model in this study are not directly observable. According to Campbell (1960), however, behaviorally relevant measures can be ascribed to each of the constructs in the research model (p. 547). The 15 constructs of the model within this study were measured using a seven-point Likert scale, where “1” would indicate “Strongly Disagree” and “7” would indicate “Strongly Agree.” Straub (1989) stressed that the nature of confirmatory research demands exacting instrument validation and quantitative analysis to establish confidence in the empirical study findings. Moreover, instrument validation – as a means to measure the accuracy of study findings – tempers any concerns with respect to the validity of the conclusions (Straub, 1989).

Capitalizing on 52 literature-based survey items to measure the model’s 15 constructs, this study measured the willingness of intelligence analysts to contribute knowledge to a KMS. In this research study, the construct *reward* was assessed using six items adapted from research by Ba et al. (2001), H. Hall (2001), Kankanhalli et al. (2005), as well as Subramanian and Soh (2009). Three items adapted from the research of Kankanhalli (2005), Orlikowski (1993), Subramanian and Soh (2009), as well as Wasko and Faraj (2000) were used to measure *power*. Three items derived from the research of

Yli-Renko et al. (2001) were used to assess the importance of *centrality* as an inducement to knowledge sharing within the organization. Within the context of this study, reward, power, and centrality were used to represent *inducements* to the contribution of knowledge to a KMS.

Three items adapted from the research of Davis (1989), Kankanhalli et al. (2005), as well as Igarria, Parasuraman, and Baroudi (1996) were used for measuring *ease in using KMS*. *Organization structure* was assessed using four items based on the investigations conducted by Crowe et al. (2002), as well as Gold et al. (2001). Research conducted by Crowe et al. (2002), as well as Lewis et al. (2003) was used as the basis for three items measuring *top management support* as an influence on an intelligence analyst's opportunity to contribute knowledge to a KMS. Within the context of this study, ease in using KMS, organization structure, and top management support represented *opportunities* to contribute knowledge to a KMS. Together, the assessment of inducements as well as opportunities to contribute to a KMS encompassed the confirmatory portion of the research study model validation (Subramanian & Soh, 2009).

The empirical investigative portion of this research study sought to measure the trust, collaborative environment, and resistance to share constructs of the research model. *Trust* was assessed using three items adapted from the findings of Athanassiou and Nigh (2000), Clarke and Rollo (2001), Crowe et al. (2002), as well as Scott (2000) and Zack (1999). The importance of establishing and nurturing a *collaborative environment* in the workplace was evaluated using two items derived from the research findings of Kraemer and Pinsonneault (1990), Sambamurthy and Chin (1994), Melin and Persson (1996), Rice and Gattiker (1999), Amabile et al. (2001), Wasko and Faraj (2000), as well as Ojha

(2005), Sonnenwald (2007), as well as Abdolvand et al. (2008). An individual's *resistance to sharing* was measured using seven items derived from the research of Zand (1972), Dweck and Leggett (1988), Szulanski (1996), Chow et al. (1999), Chow et al. (2000), Husted and Machilova (2002), Ford and Chan (2003), Oldham (2003), Sawng et al. (2003), Thomas-Hunt et al. (2003), Phillips et al. (2004), as well as Ojha (2005). Within the context of this research study, trust, collaborative environment, and resistance to share were used to represent *willingness* to contribute knowledge to a KMS.

With the antecedents for *inducements* (reward, centrality, & power) established, the impact of *inducements* on an analyst's *willingness to contribute knowledge to KMS*, as well as the impact of inducements on the construct *knowledge sharing using KMS* were then assessed. The influence of *inducements* on an analyst's contributions to a KMS were measured using two items drawing upon the published research of Bachrach and Baratz (1962), Burkhardt and Brass (1990), Kankanhalli et al. (2005), Kelley (1967), Liao (2008), Pfeffer (1981), as well as Wasko and Faraj (2000). Drawing on the published research of Bolino (1999), Fehr et al. (2013), Kelley (1967), Kim and Lee (2006), Renzl (2008), Sapienza (2001), as well as Tushman and Romanelli (1983), four items were introduced assessing the influence of *individual inducements* on an analyst's *willingness* to use of *KMS for knowledge sharing*.

Similarly, with the influencers for *opportunity* (ease in using KMS, organization structure, power) established, the *individual willingness opportunity* of an analyst to *contribute knowledge to KMS* (two items), as well as the *individual willingness opportunity* of the *knowledge sharing using KMS* (three items) was assessed drawing upon the published research of Alvai and Leidner (2001), Bandura (1986), Compeau and

Higgins (1995), Etzioni (1961), Fishbein and Ajzen (1975), Lucas (1981), as well as Levy and Green (2009). Derived from the research of Gambetta (1998), Oldham (2003), Sambamurthy and Chin (1994), Szulanski (1996), van den Hooff et al. (2012), Xu et al. (2010), as well as Zand (1972), five items were used to measure an analyst's *willingness to share knowledge using KMS*. The last of the 15 constructs supporting this research study model, *Knowledge sharing using KMS*, would be assessed by two items supported by Abdolvand et al. (2008), Alavi and Leidner (2001), Etzioni (1961), Fehr et al. (2013), Kankanhalli et al. (2005), Kelley (1967), Levy and Green (2009) as well as Lucas (1975; 1981).

#### *Expert Panel*

The procedure to notify, inform, distribute, and administer the survey instrument within the IC was coordinated through the senior leadership and Chief Knowledge Officers (CKO) of the target intelligence operations-centric departments and agencies. A formal request to conduct the survey was vetted with each of the senior leaders of the target intelligence-centric departments and agencies. The expert panel composed of 10 participants representing the senior leadership of the target intelligence-centric department or agency. Additionally, the expert panel assessed the respondent's ability to read, understand, and answer the elements of the anonymous survey instrument (Fowler, 1995). Accordingly, expert panel members were also asked to provide feedback on all survey elements. Comments received from the expert panel concerning word choice, and the order of the survey questions was reviewed to determine if the survey instrument requires revision due to concerns with readability, understandability, or answerability. Expert panel members also were informed as to the purpose, problem statement, goals,

and model under consideration in this research study. The intent was to assist the expert panel in raising their awareness, understanding, and support of this study for them to assist as much as possible in improving the internal and construct validity of the instrument. As a consequence of this activity, expert panel members were excluded from subsequent surveys.

## **Model Testing**

### *Model Fit Analysis*

This research study performed model fit testing based on SmartPLS (Version 3.2.6) Structural Equation Modeling (SEM). According to Simon and Paper (2007), literature has documented SEM as an appropriate technique for model fit examination, being superior to multiple regression analysis. The 14 propositions examined in this research study were tested using PLS-SEM assessing both the  $R^2$  as the model fit following the recommendation of Hair et al. (2017).

## **Reliability and Validity**

### *Reliability*

According to Sekaran (2003), the crux of reliability lies in the reproducibility of results in repeated trials irrespective of the survey, test, observation, or any measurement procedure employed. Leedy and Ormond (2005) defined reliability as “the extent to which measurement instrument yields consistent results when the characteristic being measured hasn’t changed” (p. 93). In short, reliability is the stability or consistency of measurements (Straub, Rai, & Klein, 2004).



In this research study, Cronbach's (1951) Alpha was used to determine instrument reliability. Cronbach's Alpha uses a sliding scale in which the lowest acceptable limit of a measure is .60, approaching complete reliability as it nears the measure of 1.0 (Gefen, Straube, & Boudreau, 2000). Nunnally (1967) and Nunnally and Berstein (1994) have argued that a more acceptable measure of reliability would be a threshold of .70. Therefore, Cronbach's Alpha analysis was conducted for each of the 15 constructs. Separate Cronbach's Alpha "if-item-is-deleted" was conducted to ensure the reliability of the specific items within each of the constructs measured to ensure the construct reliability is over the acceptable threshold of .70. Items that were demonstrated an overall construct reliability reduction would be considered for removal or further investigation.

### *Validity*

According to Gay and Airasian (2003), validity has been defined as "the degree to which a survey measures what is supposed to measure and consequently, permits interpretation of scores" (p. 23). Straub (1989) has defined *instrument validation* as the "prior and primary process in confirmatory empirical research" (p. 162). According to Golafashani (2003), if the validity or trustworthiness of the instrument can be maximized, then a more credible and defensible result may lead to generalizability. Stenbacka (2001) argued that ensuring the validity of the instrument was crucial to both doing and documenting high-quality research. Therefore, the quality of research is related to the generalizability of the result and, thereby, to the testing and increasing the validity or trustworthiness of the research.

### *Internal Validity*

Sekaran (2003) defined *internal validity* as being the confidence *measured* in the existence of a cause-and-effect relationship. The results from the data collected, using the Web-based survey instrument, drew an accurate conclusion as to the significance (or lack thereof) of the cause-and-effect relationship (Leedy & Ormrod, 2005). According to Straub (1989), an instrument is said to have internal validity when “the observed effect could have been caused by or correlated with a set of non-hypothesized and/or measured variables” (p. 151). McMillan and Schumacher (2006) argued that validity refers to the degree of congruence between the explanations of the phenomena and the realities of the world. To answer the question of enhancing validity McMillan and Schumacher (2006) indicated that continuous refinement of the sampling and data collection techniques throughout the data collection process increases its validity. Using the expert panel to conduct the pilot study served as a mechanism for the evaluation/re-evaluation of the survey instrument before dissemination to the study target population.

#### *External Validity*

Research is said to have *external validity* if the distribution of outcomes realized by a test subject group is the same as the distribution of outcome that would be realized in an actual program (Manski, 2007). Sekaran (2003) refers to external validity as to the extent to which results (e.g., from a field study) can be generalized. Campbell and Stanley (1963) took a slightly broader view stating that “external validity asks the question of generalizability: to what population, settings, treatment variables, and measurement variables can this effect be generalized?” (p. 5). This study leveraged experimental methods and measures to test propositions and generalizations associated with the research study model. This study also emphasized the measurement and analysis

of causal relationships between variables (Creswell, 2003; McMillan & Schumacher, 2006).

### **Population and Sample**

This research study was conducted with a select group of USG Departments and Agencies whose primary interest is Intelligence Operations. This study used an anonymous Web-based survey instrument. The assistance and support of the Commanders and Directors of the target USG Departments and Agencies were required to ensure the success of the survey and study. Where appropriate, coordination for the conduct of this study and survey was vetted with the Chief Knowledge Officer (CKO) of the respective organization. All survey questions and responses were UNCLASSIFIED and conducted anonymously. Information concerning the total number of Intelligence Analysts working within the USG, representing potential respondents to this research study survey, is not available to the public (Central Intelligence Agency, 2005). Initially, this research study encompassed a total population of 1,000 personnel whose primary job specialty is *Intelligence Analyst*. In the interest of producing statistically significant findings from this research study, a minimum total of 300 responses were planned for capturing through the survey instrument (Mertler & Vanatta, 2010).

### **Data Analysis**

#### *Pre-Analysis Data Screening*

The first step in pre-analysis data screening, as suggested by Levy and Ellis (2006), would be ensuring the accuracy of the data collected. According to Levy and Ellis

(2006), pre-analysis data screening ensures the early detection – and a timely opportunity – to correct irregularities or errors with the collected data. Tabachnick and Fidell (1996) have further suggested researchers must be prescriptive and forthright in ensuring the accuracy of the data to preclude erroneous study conclusions. According to Mertler and Vanatta (2010), there are four primary reasons for screening the data prior to initiating an analysis: 1) ensuring the accuracy of the data collected; 2) discovering missing or incomplete data; and, 3) assessing the effects of extreme values in the data (i.e., outliers); and, 4) assessing the adequacy of fit between the data collected and the assumptions of a specific procedure.

The second step in pre-analysis data screening would be the identification of response-sets (Levy, 2006). A response-set refers to “a series of systematic responses by a respondent that reflect a ‘bias’ or consistent pattern” (Hair et al., 1998, p. 472). Levy (2008) characterized response-set as an instance wherein a respondent marks the same score (response) for all items in the survey. Myers and Mullett (2003) proposed that a response-set might reflect true differences in attitudes or, simply reflect the tendency of some respondents to use only a portion of the rating scale. Of note, according to Ruane (2005), response-set undermines the validity and reliability of a survey. Kerlinger and Lee (2000) suggested analyzing the data for potential response-sets and to consider eliminating them from the study. An inherent issue (limitation) associated with the conduct of any anonymous survey is that the researcher has no practical way of assessing the honesty or level of conviction associated with a respondent’s responses. Given this contingency, a visual inspection of the data set was conducted as well.

The third step in the pre-analysis data screening process would be to identify missing data. According to Tabachnick & Fidell (2001), missing data is one of the most pervasive problems in data analysis. When not directly represented in the results, missing data can have a substantial impact on the results (Hair et al., 1998). Tabachnick and Tidell (2001) argued that missing data could be problematic because it allows respondents associated with missing data elements to be included within the study analysis. The survey instrument supporting this research study required all survey items to be answered before the survey could be submitted. Respondents with unanswered survey items were alerted (prompted) to answer all survey items prior to survey submission.

The fourth step in pre-analysis data screening addressed any data irregularities, referred to as outliers. Outliers are extreme data points on what would be a normal distribution curve. Tabachnick and Fidell (1996) have suggested three fundamental reasons for the existence of outliers: (1) data entry errors which are attributable to the researcher; (2) the survey respondent is not actually a member of the target population for whom the survey is intended; and, (3) the survey respondent is simply different from the other members (respondents) of the survey sample. According to Mertler and Vanatta (2010), outliers represent a moderate threat to the validity of the results. As outliers may cause a serious distortion in statistical measures, an examination of each must be conducted to determine if each should be retained or eliminated (Hair et al., 1998). As stated by Hair et al. (1998), “The researcher needs a means to objectively measure the multidimensional position of each observation relative to a common point” (p. 66), and noted that Mahalanobis Distance could be used to this end. Mahalanobis Distance was

performed on the data collected to detect multivariate outliers (Levy, 2006). Instances where multivariate outliers exist were reviewed, and if extreme, eliminated prior to data analysis.

### *Data Analysis*

Merriam (1985) proposed that assured data management includes data identification, preparation, and organization. Gall et al. (2002) have suggested that managing data encompasses the complementary aspects of (1) organizing the data and, (2) checking it for completeness. Attendant to these two purposes, Sekaran (2003) stated that the first objective of data analysis is “getting a feel for the data, testing the goodness of the data, and testing the hypotheses developed for the research” (p. 306).

This research study used SPSS<sup>®</sup>'s statistical package as well as SmartPLS (Version 3.2.6) to perform all pre-analysis data screening, reliability and validity analyses, as well as the *model testing* using PLS-SEM. SEM has been noted in IS literature as a valid technique for the analysis of conceptual model testing (Levy & Green, 2009; Simon & Paper, 2007). The 14 propositions examined in this research study were tested using the PLS-SEM analysis.

### **Resource Requirements**

Permission from specific Directors and Commanders of Department of Defense and other USG Departments and Agencies were needed to gain access to collect data from intelligence analysts serving within the target departments and agencies. A Website was constructed and used to both deploy the anonymous Web-based survey instrument that would be made available to all respondents. Following data collection, SPSS was

used to conduct the pre-analysis data screening, reliability, and validity analyses.

Following that, the constructs were developed into the original model by Subramanian and Soh (2009), and then the proposed revised model with the added willingness constructs for testing using PLS-SEM statistical analysis.

### **Summary**

In chapter three, the methodology for this research study was discussed in detail. The first section addressed the research methodology and design identifying this research study as both a confirmatory as well as empirical investigation examining the challenge of maintaining strong organizational effectiveness and productivity through the use of KMS (Beer & Nohria, 2000). This study built upon a KMS theoretical model advanced by Subramanian and Soh (2009).

The second section of this chapter addressed the specific research method employed to support this research study. A survey methodology, employing a Web-enabled anonymous survey instrument was used to collect data from survey respondents, which was then analyzed for testing the research propositions. A Web-enabled survey instrument was used because it enhanced the generalizability of the results (Dooley, 2001). The survey instrument was distributed – via a commercial Website – to a group of intelligence analysts (the survey respondents) assigned to intelligence operations-centric departments and agencies within the USG. Survey participant notifications were made upon Institution Review Board (IRB) approval, which was obtained from Nova Southeastern University, as well as by the IRB authorities of the various participatory activities, agencies, and organizations.

The third section of this chapter addressed the development and validation of the survey instrument. This study would capitalize on survey items to measure the constructs adapted from previously validated studies conducted by Chowdbury (2005), Kankanhalli et al. (2005), as well as Subramanian and Soh (2009). The 15 constructs of the model introduced in this study measured responses using a seven-point Likert scale, where “1” would indicate “Strongly Disagree” and “7” would indicate “Strongly Agree.” Straub (1989) stressed that the nature of confirmatory research demands exacting validation and quantitative analysis to establish confidence in the empirical study findings. The procedure to notify, inform, distribute, and administer the survey instrument within the IC was coordinated through the senior leadership and CKO of the target intelligence operations-centric departments and agencies. An expert panel composed of ten participants representing the senior leadership of the target intelligence operations-centric department or agency. Expert panel members were asked to provide feedback on all survey elements.

The fourth section of this chapter focused on the testing of the research study model. This research study used SPSS<sup>®</sup> statistical package as well as SmartPLS (Version 3.2.6) to perform *model fit testing* based on structural equation modeling (SEM). The 14 propositions considered in this research study were tested using a model-fit and path coefficients analyses (Tabachnick & Fidell, 2001; Wold, 1982; 1985).

Section five of this chapter examined the reliability and validity of the model and model testing. According to Sekaran (2003), the crux of reliability lies in the reproducibility of results in trials irrespective of the survey, test, observation, or any measurement procedure employed. In this research study, Cronbach’s (1951) Alpha was



used to determine instrument reliability; and, Cronbach's Alpha analysis was conducted for each of the model 15 constructs. According to Gay and Airasian (2003), validity has been defined as "the degree to which a survey measures what is supposed to measure and consequently, permits interpretation of scores" (p. 23). Sekaran (2003) defined *internal validity* as being the confidence *measured* in the existence of a cause-and-affect relationship. The results from the data collected, using the survey instrument, drew an accurate conclusion as to the significance (or lack thereof) of the cause-and-effect relationship (Leedy & Ormrod, 2005). Research is said to have *external validity* if the distribution of outcomes realized by a test subject group is the same as the distribution of outcome that would be realized in an actual program (Manski, 2007).

Section six of this chapter spoke to the research study survey population and representative sample. This study was conducted with a select group of USG departments and agencies whose primary interest is intelligence operations. Initially, this research study encompassed a total population of 1,000 personnel whose primary job specialty is Intelligence Analyst. In the interest of producing statistically significant findings from this study, a minimum number of 300 responses were captured through the survey instrument (Mertler & Vanatta, 2010).

Data analysis was addressed in section seven of this chapter, beginning with pre-analysis data screening. There are four primary reasons for screening the data prior to initiating an analysis: 1) ensuring the accuracy of the data collected; 2) discovering missing or incomplete data; and, 3) assessing the effects of extreme values in the data (i.e., outliers); and, 4) assessing the adequacy of fit between the data collected and the assumptions of a specific procedure (Mertler & Vanatta, 2010). Following pre-analysis

data screening, data analysis was conducted using the SPSS as well as SmartPLS (Version 3.2.6) supporting SEM statistical analysis.

The final section of this chapter addressed the resource and coordination requirements of this research study. Permission from specific Directors and Commanders of USG departments and agencies was needed to collect data from intelligence analysts serving within the target departments and agencies. A Website was constructed and used to both develop and deploy a Web-based survey instrument that was made available to all respondents.

## Chapter 4

### Results

#### **Overview**

This chapter outlines the data analysis and the results of this research study. This chapter also provides the detailed results of this research study. This chapter begins with a discussion of the research problem this study addressed, as well as the main goal of this research study. This chapter also addresses the survey validation procedures employed, including the use of the expert panel supporting this study.

This chapter also addresses the population surveyed, the data collection and analysis efforts, including the response rate, pre-analysis data screening, description of the study participants, as well as the result of the reliability analysis. This chapter examines the results of the *investigative* portion of this study, focusing on the new constructs introduced within this research study: *trust*, *collaborative environment*, *resistance to knowledge sharing*, as well as the impact *inducement* and *opportunity* on an individual's *willingness* to share knowledge through a KMS. This chapter also examines the confirmatory portion (as advanced by Subrmanian & Soh, 2009) of this research study wherein the impact of inducement (including the constructs reward, power, & centrality) as well as *opportunity* (encompassing the constructs of *ease of use*, *organization structure*, & *top management support*) are assessed as factors in one's willingness to contribute to a knowledge sharing repository. This chapter concludes with an overall summary of the results of this study.

*Research Problem and Goal*

The research problem this study addressed is the challenge of maintaining strong organizational effectiveness and productivity through the use of KMS (Beer & Nohria, 2000; Benbya & Belbaly, 2005; Burley & Pandit, 2009; Furner et al., 2009). The main goal of this study was to empirically assess a conceptual model to test the impact of the factors of *reward, power, centrality, trust, collaborative environment, resistance to share, ease-of-using KMS, organization structure, and top management support to inducement, willingness to share*, as well as *opportunity* to contribute knowledge to a KMS on knowledge-sharing in the context of the highly classified and sensitive environment of the USG IC.

This study builds upon the impact of the *inducement* and *opportunity* factors encompassed with the Subramanian and Soh (2009) theoretical model. This study also assessed the impact of inducements and opportunity factors on an individual's *willingness to share* in contributing knowledge to a KMS (Boland et al., 1994). In this research study, a new research model was proposed centering on a new set of constructs focused on an intelligence analyst's willingness to contribute his/her knowledge to a KMS (Devaraj & Kohli, 2003; Faniel & Majczak, 2002). These new constructs were: the degree or measure of *Trust* imbued in the KMS, the creation and sustainment of a *Collaborative Environment*, and an examination of an analyst's *Resistance to Share* in a collaborative environment supported by KMS (Burkhardt & Brass, 1990; Constant et al., 1996).

#### *Main Research Question*

The main research question this study posed was: What is the impact of the factors of *reward, power, centrality, trust, collaborative environment, resistance to share,*

*ease-of-using KMS, organization structure, and top management support to inducement, willingness to share, as well as opportunity to contribute knowledge to KMS on knowledge sharing in a highly classified and sensitive environment?* The main research question that this study addressed is defined by three distinct investigative elements: (1) the degree of *trust* that a contributor has in his colleagues; and, within the boundaries of the organization's culture, the perceived employee's level of *trust* the contributor has ascribed to his organization's leadership and management; (2) the evolving boundaries of the *collaborative environment* in which the individual operates; and, (3) the contributor's innate *resistance to sharing* knowledge. All three aspects contribute to the contributor's *willingness to share* knowledge and to, ultimately, contribute to the organization's KMS.

This research study was a confirmatory empirical investigation examining the challenge of maintaining strong organizational effectiveness and productivity through the use of KMS (Beer & Noharia, 2000). The results of this research study build the impact of the inducement factors encompassed within the Subramanian and Soh (2009) theoretical model, the constructs of reward, power, centrality, organization structure, and top management support. This research study also examined the opportunities to moderate (*influence*) these factors, as well assess the impact on an individual's willingness to share knowledge for the purpose of establishing/facilitating a KMS in a highly classified and sensitive environment (Boland et al., 1994).

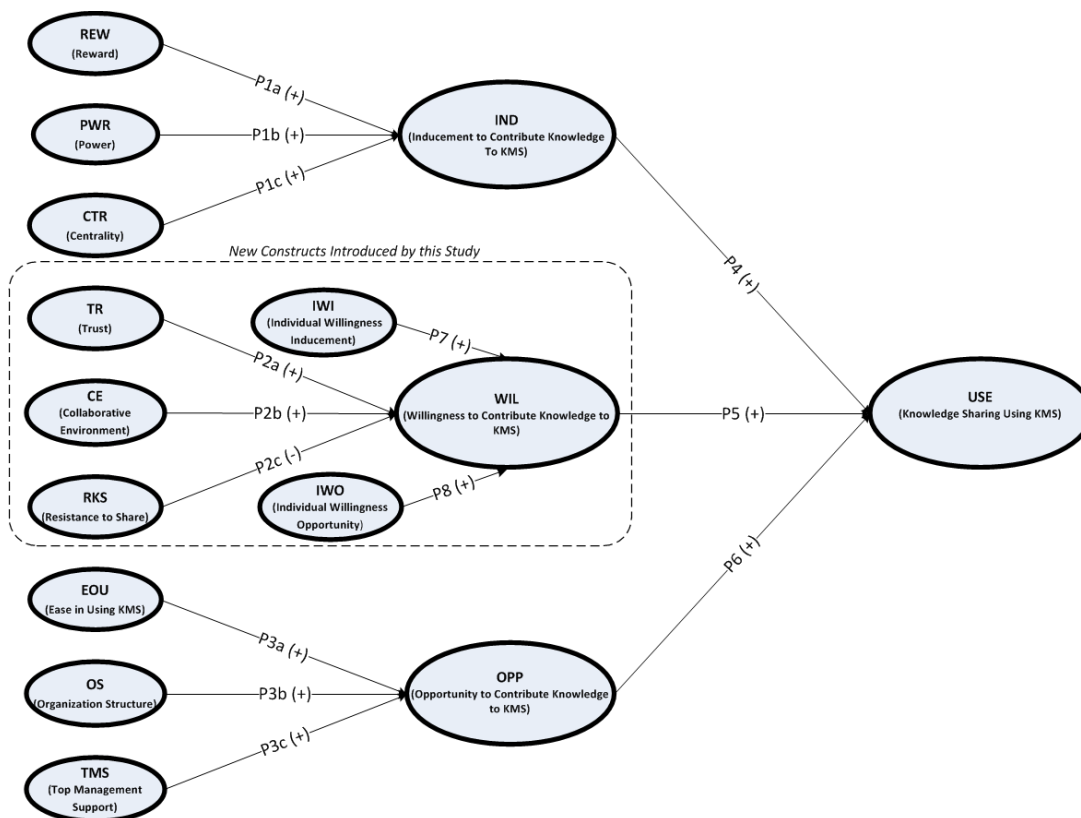
### *Research Propositions*

The specific research propositions addressed in this study were (See Figure 4):

- P1a: An employee's perceived *reward* will demonstrate a significant positive influence on his/her *inducement* to contribute knowledge to the KMS.
- P1b: An employee's perceived increase in *power* within the organization will demonstrate a significant positive influence on his/her *inducement* to contribute to the KMS.
- P1c: An employee's perception of increased *centrality* within the collaborative hierarchy will demonstrate a significant positive influence on his/her *inducement* to contribute to the KMS.
- P2a: An employee's perceived *trust* in a collaborative environment will demonstrate a significant positive influence on his/her *willingness* to contribute knowledge to the KMS.
- P2b: An employee's perceived value of a *collaborative environment* within the organization will demonstrate a significant positive influence on his/her *willingness* to contribute to the KMS.
- P2c: An employee's perceived *resistance to share* within a collaborative environment will demonstrate a significant negative influence on his/her *willingness* to contribute to the KMS.
- P3a: An employee's perceived *ease of use* in the supporting technology within the collaborative environment will demonstrate a significant positive influence on his/her *opportunity* to contribute knowledge to the KMS.
- P3b: An employee's perceived value of a *supportive organization structure* will demonstrate a significant positive influence on his/her *opportunity* to contribute to the KMS.

- P3c: An employee's perceived value *top management support* of the collaborative environment by will demonstrate a significant negative influence on his/her *opportunity* to contribute to the KMS.
- P4: An employee's *inducement* to contribute knowledge to the KMS will demonstrate a significant positive influence on his/her knowledge sharing using KMS.
- P5: An employee's *willingness* to contribute to the KMS will demonstrate a significant positive influence on his/her knowledge sharing using KMS.
- P6: An employee's *opportunity* to contribute to the KMS will demonstrate a significant positive influence on his/her knowledge using KMS.
- P7: An employee's *individual willingness inducement* to contribute to the KMS will demonstrate a significant positive influence on his/her *willingness* to contribute knowledge to the KMS.
- P8: An employee's *individual willingness opportunity* to contribute to the KMS will demonstrate a significant positive influence on his/her *willingness* to contribute knowledge to the KMS.

This confirmatory, as well as exploratory research study, addressed the 14 specific research propositions outlined in Figure 3.



**Figure 3:** The Inducement-Willingness-Opportunity Framework on the Use of KMS by Knowledge Contributors from the US Government Intelligence Community

## Survey Validation Procedures

### *Expert Panel*

An expert panel was recruited to improve the validity of the survey instrument. The expert panel selected was composed of 10 participants representing the senior leadership of the target intelligence-centric departments, activities, or agencies. The areas expertise this select group of panelists boasted included statistical analysis, strategic/operational/military intelligence analysis, survey design, human behavior, information and operational security, as well as knowledge management. All 10 of the



expert panel members initially invited to participate as expert panel members accepted their invitation to participate.

Expert panel members were also informed as to the purpose, problem statement, goals, and research model under consideration in this research study. The intent of these notifications and collaborative activities was to assist the expert panel in raising their awareness, understanding, and support of this study in order for them to participate to the fullest extent possible in improving the internal and construct validity of the instrument. As a consequence of this effort to fully immerse the expert panel in the formative processes of this research study, expert panel members were excluded from subsequent surveys.

The expert panel members reviewed the Web-based survey instrument, which was hosted on a commercial (Unclassified) Website, and completed the anonymous survey instrument online. Each panel member assessed the respondent's ability to read, understand, and answer the elements of the survey instrument (Fowler, 1995). Comments received from the expert panel concerning word choice, and the order of the survey questions was reviewed to determine if the survey instrument required revision due to concerns with readability, understandability, or answerability. Accordingly, expert panel members were asked to provide feedback on all survey items. Overall, the expert panel feedback on the survey instrument items proved to be very positive.

Additionally, the expert panel members significantly influenced the procedure to notify, inform, distribute, and administer the survey instrument within the IC. IC participation was coordinated through the senior leadership and CKO of the target intelligence operations-centric departments and agencies contributing greatly to the

success realized in data collection. A formal request to conduct the survey was vetted with each of the senior leaders of the target intelligence-centric departments and agencies.

The participation of the expert panel members affected this research study in two ways: (1) the expert panel members asked that the identity of the individual departments, agencies, activities, and services who provided survey participants remain anonymous; and, (2) the expert members recommended that the demographic information collected as a part of the survey instrument be administered at the beginning of the survey instrument rather than at the end as originally designed. The expert panel members, as a group, argued that the resulting responses from survey participants would be more accurate, focused, as well as realize a greater participant response rate if the demographic information collected was gathered at the beginning of the survey instrument rather than at the end (Teclaw, Price, & Osatuke, 2010). As the reporting of demographic information is not a part of this research study, and the request for anonymity has no impact on the results of this survey study, both revision requests received from the expert panel were honored.

#### *Pilot Study*

A limited pilot study was conducted on the survey instrument following the incorporation of the recommendations cited in the *Expert Panel* section of this research study. The pilot study was conducted with 25-targeted participants from functionally diverse agencies and activities within the IC. The direct solicitation of pilot study participants was arranged via email and telephone communication by and through the expert panel membership. The identity of the pilot study participants is unknown to the

researcher. Attesting to the clarity of the survey instrument, pilot study participant comments were restricted exclusively to the length of the survey instrument rather than to survey item readability or clarity.

## **Data Collection and Analysis**

### *Main Data Collection*

This study used a quantitative anonymous survey methodology exercised through a Web-enabled survey instrument. The survey method employed was used to collect data for the testing of the 14 research propositions encompassed within this research study. This methodology was selected because it enhanced the generalizability of the results (Dooley, 2001).

The survey instrument used in this research study was distributed – via a commercial (Unclassified) Website – to a select group of intelligence analysts (participants) assigned to specific intelligence operations-centric departments and agencies within the USG. Survey participants were notified of the Website with the appropriate Website survey link by their colleagues using professional social media, as well as professional and personal forums. All survey respondents were advised to complete the research study survey instrument on their personal time using their personal devices. Survey participant notifications were made upon Institution Review Board (IRB) approval of this study by Nova Southeastern University, as well as by the IRB approval authorities of the various participatory activities, agencies, and organizations.

A total of 536 anonymous responses were received. A potential response rate for the survey could not be determined due to the nature of the targeted population. Information concerning the total number of Intelligence Analysts working within the

USG, representing potential respondents to this research study survey, is not available to the public (Central Intelligence Agency, 2005).

#### *Instrument Development and Validation*

According to Straub (1989), confirmatory empirical research will be strengthened when validation of the instrument used to test the validity of the research constructs occurs. This research study capitalized on survey items to measure the constructs adapted from three previously validated studies conducted by Chowdbury (2005), Kankanhalli et al. (2005), as well as Subramanian and Soh (2009). As observed by Blalock (1979), a number of the constructs advanced in the model in this study were not directly observable. According to Campbell (1960), however, behaviorally relevant measures can be ascribed to each of the constructs in the research model (p. 547). The 15 constructs of the model within this research study were measured using a seven-point Likert scale, where “1” indicated “Strongly Disagree” and “7” indicated “Strongly Agree.” Straub (1989) stressed that the nature of confirmatory research demands exacting instrument validation and quantitative analysis to establish confidence in the empirical study findings. Moreover, instrument validation – as a means to measure the accuracy of study findings – tempers any concerns with respect to the validity of the conclusions (Straub, 1989).

#### *The Research Model Construct Items*

This study measured the willingness of intelligence analysts to contribute knowledge to a KMS, using 52 literature-based survey items to measure the model’s 15 constructs. In this research study, the construct *reward* was assessed using six items adapted from research by Ba et al. (2001), H. Hall (2001), Kankanhalli et al. (2005), as

well as Subramanian and Soh (2009). Three items adapted from the research of Kankanhalli (2005), Orlikowski (1993), Subramanian and Soh (2009), as well as Wasko and Faraj (2000) were used to measure *power*. Three items derived from the research of Yli-Renko et al. (2001) were used to assess the importance of *centrality* as an inducement to knowledge sharing within the organization. Within the context of this study, reward, power, and centrality were used to represent *inducements* to the contribution of knowledge to a KMS.

Three items adapted from the research of Davis (1989), Kankanhalli et al. (2005), as well as Igarria et al. (1996), were used for measuring *ease in using KMS*.

*Organization structure* was assessed using four items based on the investigations conducted by Crowe et al. (2002) and Gold et al. (2001). Research conducted by Crowe et al. (2002) and Lewis et al. (2003) was used as the basis for three items measuring *top management support* as an influence on an intelligence analyst's opportunity to contribute knowledge to a KMS. Within the context of this study, ease in using KMS, organization structure, and top management support represented *opportunities* to contribute knowledge to a KMS. Together, the assessment of inducements as well as opportunities to contribute to a KMS encompassed the confirmatory portion of the research study model validation (Subramanian & Soh, 2009).

The empirical investigative portion of this research study sought to measure the trust, collaborative environment, and resistance to share constructs of the research model. *Trust* was assessed using three items adapted from the findings of Athanassiou and Nigh (2000), Clarke and Rollo (2001), Crowe et al. (2002), Scott (2000), as well as Zack (1999). The importance of establishing and nurturing a *collaborative environment* in the

workplace was evaluated using two items derived from the research findings of Kraemer and Pinsonneault (1990), Sambamurthy and Chin (1994), Melin and Persson (1996), Rice and Gattiker (1999), Amabile et al. (2001), Wasko and Faraj (2000), Ojha (2005), Sonnenwald (2007), as well as Abdolvand et al. (2008). An individual's *resistance to sharing* was measured using seven items derived from the research of Zand (1972), Dweck and Leggett (1988), Szulanski (1996), Chow et al. (1999), Chow et al. (2000), Husted and Machilova (2002), Ford and Chan (2003), Oldham (2003), Sawng et al. (2003), Thomas-Hunt et al. (2003), Phillips et al. (2004), as well as Ojha (2005). Within the context of this research study, trust, collaborative environment, and resistance to share were used to represent *willingness* to contribute knowledge to a KMS.

With the antecedents for *inducements* (reward, centrality, & power) established, the impact of *inducements* on an analyst's *willingness to contribute knowledge to KMS*, as well as the impact of inducements on the construct *knowledge sharing using KMS* were then assessed. The influence of *inducements* on an analyst's contributions to a KMS were measured using two items drawing upon the research of Bachrach and Baratz (1962), Burkhardt and Brass (1990), Kankanhalli et al. (2005), Kelley (1967), Liao (2008), Pfeffer (1981), as well as Wasko and Faraj (2000). Drawing on the research of Bolino (1999), Fehr et al. (2013), Kelley (1967), Kim and Lee (2006), Renzl (2008), Sapienza (2001), as well as Tushman and Romanelli (1983), four items were introduced in assessing the *individual willingness inducements* in the context of use of *KMS for knowledge sharing*.

Similarly, with the influencers for *opportunity* (ease in using KMS, organization structure, power) established, *individual willingness opportunity* in the context of an

analyst's *willingness to contribute knowledge to KMS* as a function of opportunity (two items), as well as the *opportunity* in the context of *knowledge sharing using KMS* (three items) was assessed drawing upon the published research of Alvai and Leidner (2001), Bandura (1986), Compeau and Higgins (1995), Etzioni (1961), Fishbein and Ajzen (1975), Lucas (1981), as well as Levy and Green (2009). Derived from the research of Gambetta (1998), Oldham (2003), Sambamurthy and Chin (1994), Szulanski (1996), van den Hooff et al. (2012), Xu et al. (2010), as well as Zand (1972), five items were used to measure an analyst's *willingness to share knowledge using KMS*. The last of the 15 constructs supporting this research study model, *Knowledge sharing using KMS*, was assessed by two items supported by the research of Abdolvand et al. (2008), Alavi and Leidner (2001), Etzioni (1961), Fehr et al. (2013), Kankanhalli et al. (2005), Kelley (1967), Levy and Green (2009), as well as Lucas (1975; 1981).

#### *Pre-analysis Data Screening*

In addressing each of the four pre-analysis data screening contingencies outlined in the prior chapter, survey responses were subject to a pre-analysis data screening whereby all of the data collected was reviewed for data accuracy; missing data, outliers, and response sets. This pre-analysis data screening was accomplished using the native descriptive statistics capabilities associated with the SPSS. The survey instrument was configured to allow only a single valid answer to each of the survey questions. Additionally, all survey questions required an answer before submission, or the survey instrument was not accepted. As a consequence, there were no missing or incomplete data. All 536 surveys submitted were complete.

The risk associated with extreme cases was mitigated through the use of the Mahalanobis Distance analysis, which was used to identify multivariate outliers. The SPSS statistical package was used to perform the descriptive statistics analysis determining the Mahalanobis Distance analysis. No extreme values or multivariate outliers were identified. Thus, no further actions were taken.

In addition to the considerations encompassed within these four contingencies, a visual inspection of the data set was conducted as well. Survey data was examined for response set to mitigate the threat to the validity of the response sets received. There were a total of 11 response-set violations (CaseIDs: 20, 125, 129, 146, 147, 154, 347, 401, 428, & 428). In each case, the survey participant selected the same score for all items within the instrument, with the clear indication that it was 100% response-set (Levy, 2006). Such cases where respondents intentionally misrepresent their responses can negatively affect the validity of the result (Leedy & Ormrod, 2005). These cases were removed before further analyses. At the conclusion of the pre-analysis data screening, the response sets of 525 participants (respondents) were determined to be valid (N=525). Of note, the demographics data collected by the survey instrument supporting this study is not reviewed within the context of this research study, as it is not part of the research study methodology due to the nature of the sample.

## **Findings**

### *Model Testing – The Inducement-Willingness-Opportunity Framework*

This research study performed model fit testing using SmartPLS (Version 3.2.6) for PLS-SEM. According to Simon and Paper (2007), literature has documented SEM as



an appropriate technique for model fit testing. PLS-SEM is a variance-based method to estimate structural equation models (Hair et al., 2017). The goal of using PLS-SEM is to maximize the explained variance in the exogenous variables (variables that can serve only as a dependent variable or as both independent or dependent variables) in a structural model (Hair et al., 2017). The 14 propositions in this research study were tested using PLS-SEM (Hair et al., 1998).

### *Reliability Analysis*

According to Sekaran (2003), the core of reliability lies in the reproducibility of results in repeated trials irrespective of the survey, test, observation, or any measurement procedure employed. Leedy and Ormond (2005) defined reliability as “the extent to which measurement instrument yields consistent results when the characteristic being measured hasn’t changed” (p. 93). In short, reliability is the stability or consistency of measurements (Straub et al., 2004).

In this research study, Cronbach’s Alpha was used to determine construct reliability. Cronbach’s Alpha uses a sliding scale in which the lowest acceptable limit of a measure is .60, approaching complete reliability as it near the measure of 1.0 (Gefen, Straube, & Boudreau, 2000). Nunnally (1967) as well as Nunnally and Berstein (1994) have argued that a more acceptable measure of reliability would be a threshold of .70.

A Cronbach’s Alpha was calculated for each of the 15 constructs supporting this study’s research model. A separate Cronbach’s Alpha “if-item-is-deleted” was also computed to ensure the reliability of the specific items within each of the measured constructs to ensure the construct reliability was over the acceptable threshold of .70. In this research study, the Cronbach’s Alpha for all constructs demonstrated a very high

reliability ranging from 0.694 to 0.945, the exception being one 2-item construct – Collaborative Environment (CE) – with a Cronbach’s Alpha of 0.416 (See Table 14). According to Mertler and Vanetta (2010), while the low Cronbach’s Alpha of 0.416 demonstrates some reliability when the sample size is greater than 150 (N=525 in this study), it is further dependent upon the number of items, which in this case was the lowest for Cronbach’s Alpha calculation, thus, and given that it was in the original Subramanian and Soh (2009) model as well, the two item construct of CE was retained. However, the reliability in the construct CE merits further investigation.

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**Table 14.** Reliability Analysis – Cronbach’s Alpha (N=525)

<b>Construct Name</b>	<b>Construct Acronym</b>	<b>Cronbach’s Alpha</b>	<b>Number of Items</b>
Reward	REW	0.945	6
Power	PWR	0.917	3
Centrality	CTR	0.863	3
Trust	TR	0.822	3
Collaborative Environment	CE	0.416	2
Resistance to Knowledge Sharing	RKS	0.858	7
Ease of Use	EOU	0.900	3
Organization Structure	OS	0.800	4
Top Management Support	TMS	0.798	3
Inducements	IND	0.811	2
Willingness to Contribute	WIL	0.930	5
Opportunity	OPP	0.798	3
Use of KMS	USE	0.930	2
Individual Willingness Inducement	IWI	0.697	4
Individual Willingness Opportunity	IWO	0.803	2

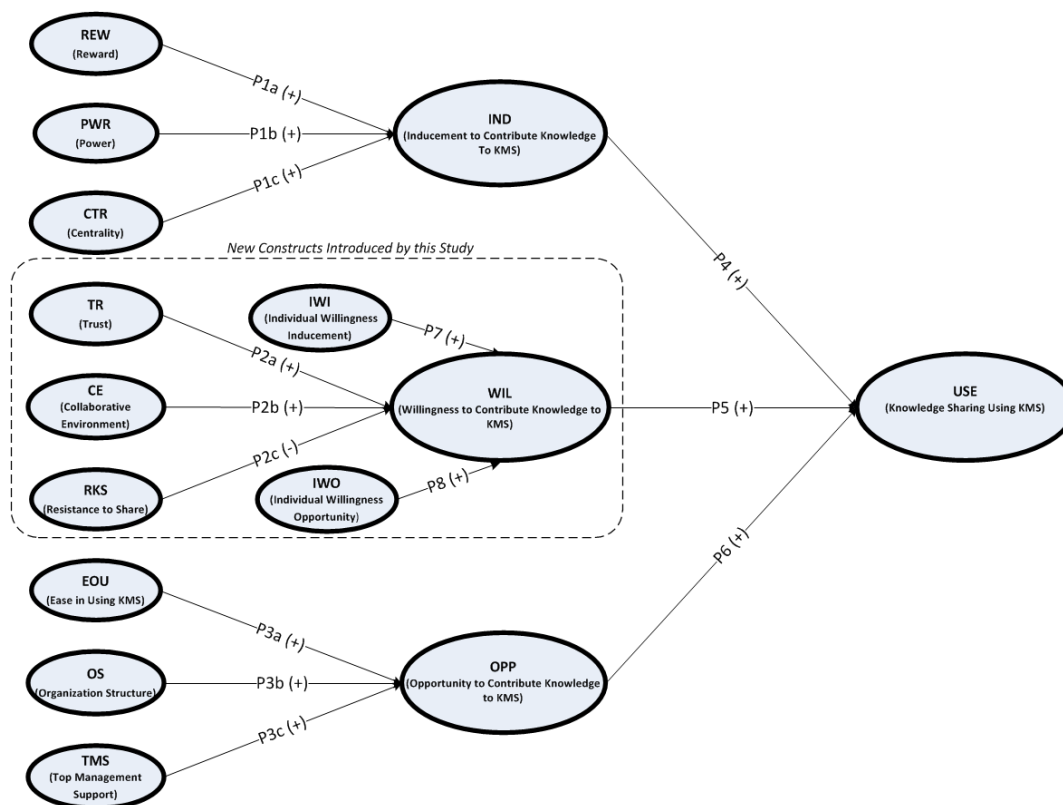
### *Validity Analysis*

This research study capitalized on survey items to measure the constructs adapted from three previously validated studies conducted by Chowdbury (2005), Kankanhalli et al. (2005), as well as Subramanian and Soh (2009). Additionally, this research study employed the use of an expert panel, as well as performing pilot testing using the final survey instrument. The 525 valid responses obtained through the survey instrument, according to Tabachnick and Fidell (2007) represents a “very good” population sample size with “very good” reliability (Mertler & Vanetta, 2010).

### *Model Fit Testing Results*

The research study model was tested using PLS-SEM with SmartPLS (Version 3.2.6). SmartPLS is a commercial software product that leverages a graphical user interface to conduct variance-based SEM using the PLS method. SmartPLS is commonly used in support of empirical research to analyze collected data (i.e., typically survey data) as well as the testing of hypothesized relationships. In this research study, the collected data (e.g. 525 valid responses) taken from the anonymous survey instrument was imported into SmartPLS in the form of a comma separated value (.csv) file. The research model depicted in Figure 4 was generated within PLS-SEM to facilitate model testing using the ingested .csv file. SmartPLS was used to generate the path models used to visually display the research study propositions as well as the variable relationships that are examined when SEM is applied (Hair et al., 2011). In PLS-SEM, arrows are always single-headed, denoting directional relationships. More importantly, single-headed arrows also indicate causal relationships and, with strong theoretical support, can be interpreted as causal relationships (Hair et al., 2014). Assessment of the structural model

results allows the researcher to determine how well empirical data supports the propositions being advanced, therefore, deciding whether or not the concept/theory being advanced is empirically confirmed (Hair et al., 2014).



**Figure 4:** The Inducement-Willingness-Opportunity Framework (Proposed Model) on the Use of KMS by Knowledge Contributors from the USG IC

Before executing the PLS-SEM algorithm calculations, bootstrapping was conducted on the validated data supporting the research model. As recommended, 525 samples were drawn from the original data using the bootstrapping procedure (Hair et al., 2017). Bootstrapping was used to determine standard errors of coefficients – assessing their statistical significance – without relying on distributional assumptions.

Following the bootstrapping procedure, the PLS-SEM algorithm calculation was used to generate the results for the evaluation of the formative measurement models. A

summary of the proposition results and reliability of the research model framework is as shown in Table 15. As rendered within Table 15, the results are displayed by research study proposition, the accompanying construct (causal) relationships, as well as the associated model path coefficient, T-value, and *p*-value for each relationship.

Path coefficients close to +1 in value are considered to have a strong positive relationship (& vice versa for negative values/relationships) (Hair et al., 2017). Generally, the closer the estimated path coefficients are to zero, the weaker the relationship between the variables – very low values close to zero are usually not significant (Hair et al., 2017). By design, the PLS-SEM algorithm was executed until the results stabilize (i.e., converge). With the PLS-SEM algorithm converged, the final calculated outer weights were used to compute the final latent variable scores. In turn, these scores served as input to run the PLS-SEM analysis to determine the final estimates for the path relationships within the research study structural model (Hair et al., 2017). The path estimates, drawn between the latent variables within the research structural model, are reported as standard coefficients. In interpreting the results of a path model, testing the significance of all structural model relationships is accomplished by reporting the *t*- and *p*-values (Hair et al., 2017). The path coefficients for the structural model can be interpreted relative to one another. If one path coefficient is larger than another, its effect on the endogenous latent variable can be interpreted as being greater (Hair et al., 2017).

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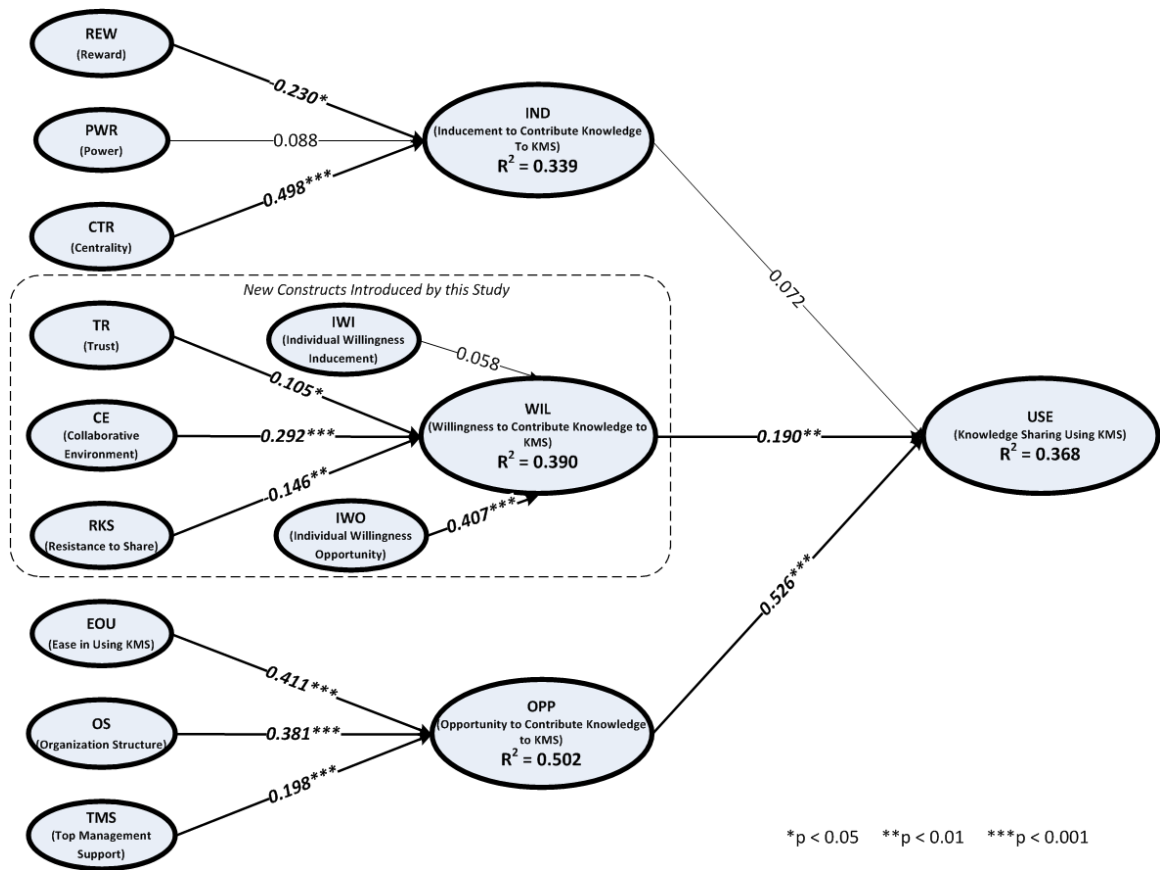
**Table 15.** Summary of Proposition Results and Reliability of the Inducement-Willingness-Opportunity Framework (N=525)

<b>Prop. #</b>	<b>Relations:</b>	<b>Path Coefficients</b>	<b>t- Statistics</b>	<b><i>p</i>-value</b>	<b>+ or – Relationship</b>	<b>Supported</b>
P1a:	REW -> IND	-0.230	2.121	<i>0.034*</i>	<i>Significant -</i>	<i>Yes</i>

P1b:	PWR -> IND	0.088	1.408	0.160	Non-Significant +	No
P1c:	CTR -> IND	0.498	10.487	<b>0.000***</b>	<b>Significant +</b>	<b>Yes</b>
P2a:	TR -> WIL	0.105	2.071	<b>0.039*</b>	<b>Significant +</b>	<b>Yes</b>
P2b:	CE -> WIL	0.292	8.208	<b>0.000***</b>	<b>Significant +</b>	<b>Yes</b>
P2c:	RKS -> WIL	-0.146	2.484	<b>0.013**</b>	<b>Significant -</b>	<b>Yes</b>
P3a:	EOU -> OPP	0.411	10.994	<b>0.000***</b>	<b>Significant +</b>	<b>Yes</b>
P3b:	OS -> OPP	0.381	8.427	<b>0.000***</b>	<b>Significant +</b>	<b>Yes</b>
P3c:	TMS -> OPP	0.198	4.418	<b>0.000***</b>	<b>Significant +</b>	<b>Yes</b>
P4:	IND -> USE	0.072	1.759	0.079	Non-Significant +	No
P5:	WIL -> USE	0.190	3.309	<b>0.001**</b>	<b>Significant +</b>	<b>Yes</b>
P6:	OPP -> USE	0.526	13.703	<b>0.000***</b>	<b>Significant +</b>	<b>Yes</b>
P7:	IWI -> WIL	0.058	1.012	0.312	Non-Significant +	No
P8:	IWO -> WIL	0.407	6.928	<b>0.000***</b>	<b>Significant +</b>	<b>Yes</b>

\*p < 0.05; \*\*p < 0.001; \*\*\*p < 0.0001

As depicted in the columnar data in Table 15, a path coefficient, t-statistics, and *p*-value has been calculated – using SmartPLS – for each proposition as well as its associated causal relationship within the structural model advanced in this study. The ‘findings’ (whether or not a significant positive or negative relationship exists) are depicted in *bold italic* text for ease of interpretation. Of note, these statistical values and determinations of positive or negative significance address both the confirmatory as well as investigative interests of this research study. The column labeled “Supported” was created to reflect the “expected findings” of this analysis based upon the extensive literature review conducted in support of this research study. These findings are based upon the validated responses of 525 current and former intelligence analysts from the USG IC.



**Figure 5.** Inducement-Willingness-Opportunity Framework – PLS-SEM Analysis Results (N=525)

Figure 5 graphically depicts the content of Table 15. Coefficient paths that are deemed significant, both positive as well as negative, are denoted by heavy (darkened) lines. Each path also reflects the ascribed path coefficient, with that added determinant – ( $p$ -value) for the path within the research structural model. Literature indicates that the  $p$ -value is “the probability of erroneously rejecting a true null hypothesis (i.e., assuming a significant effect when there is no significance) (Hair et al., p. 153). Generally, researchers will select a significance level of 5%, implying that the  $p$ -value must be smaller than 0.05 in order to judge the relationship under consideration as being significant (Hair et al., 2017). When a researcher chooses to be very conservative or

restrictive in the testing of relationships with the structural model, the significance level is ordinarily set to 1% (0.01) (Hair et al., 2017). As can be seen in Figure 6, 11 of the 14 propositions the  $p$ -values associated with each of the 11 path coefficients is statistically significant.

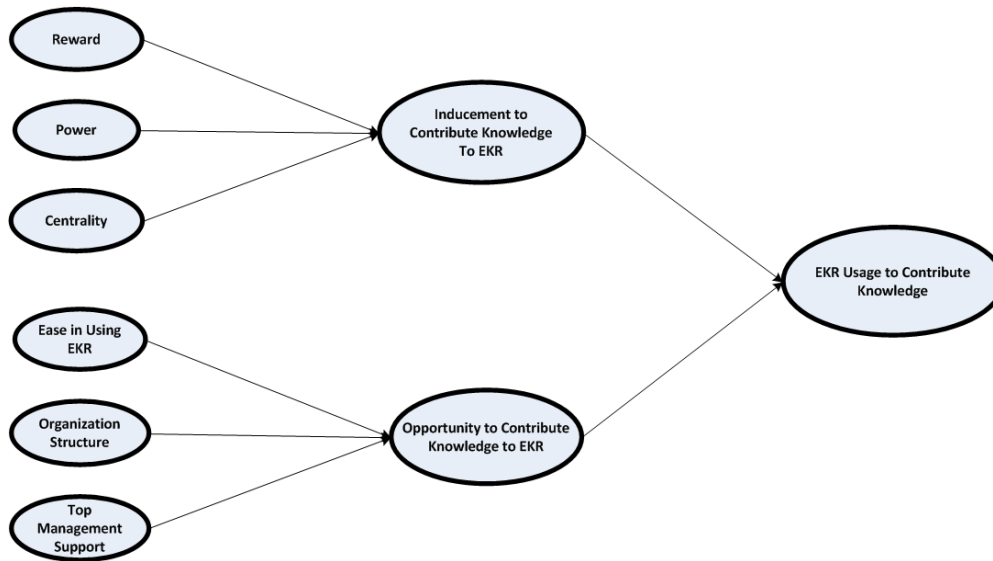
In Figure 6, in addition to the path coefficients produced from the estimation of the partial regression models within the research study structural model, the output depicted includes the  $R^2$  values of each of the endogenous latent variables contained within this research study's structural model (Hair et al., 2017). According to Hair et al. (2017) the path coefficients and the coefficients of determination ( $R^2$  values) of the structural model are examined first. The coefficient of determination ( $R^2$  value) is the most commonly used measure to evaluate a structural model. The  $R^2$  value is a measure of the model's predictive accuracy (Hair et al., 2017). The  $R^2$  value ranges from 0 to 1, with higher values indicating higher levels of predictive accuracy. Literature indicates that it can be challenging to ascribe criterion for what are acceptable  $R^2$  values as this is a function of both the structural model complexity and the nature of the research discipline (Henseler et al., 2009). In research studies centered on disciplines such as consumer behavior, an  $R^2$  value of 0.20 is considered high (Hair et al., 2017). In studies focused on marketing issues,  $R^2$  values of 0.75 and above are expected (Hair et al., 2017). Scholarly research centered on marketing matters ascribes to the  $R^2$  values of 0.75, 0.50, and 0.25 the descriptive terms substantial, moderate, or weak when referring to a structural model's predictive accuracy (Henseler et al., 2009; Hair et al., 2014; 2017). As can be seen in Figure 6, the  $R^2$  values (coefficients of determination) with the structural model



approach the moderate level in terms of the predictability and accuracy of the PLS path model.

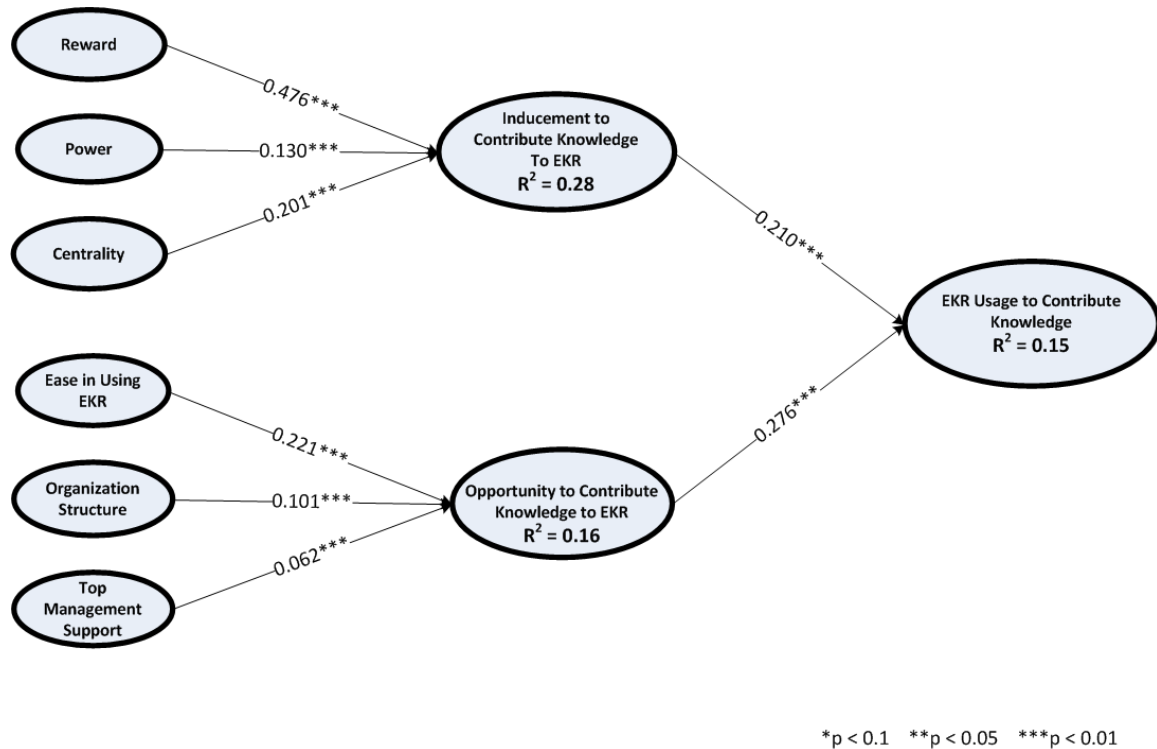
*Model Testing – The Inducement-Opportunity Framework (Subramanian & Soh, 2009)*

Depicted in Figure 6 is the Inducement-Opportunity structural framework research model introduced by Subramanian and Soh (2009) in their research focused on examining electronic knowledge repository (EKR) usage by an international software firm. In their research Subrmanian and Soh (2009) examined the willingness of 180 software developers (knowledge contributors), from a single international software development company, to contribute their knowledge to an EKR. Reflecting the confirmatory aspects of this Inducement-Opportunity framework research study, the constructs – as well as construct items – introduced by Subramanian and Soh (2009) as the Inducement and Opportunity framework, are replicated within this Inducement-Willingness-Opportunity framework research study. This replication of Inducement and Opportunity constructs and construct items was rigorously adhered to substantiate, as well as build upon, the confirmatory findings of this research study's Inducement-Willingness-Opportunity structural framework. Of note, both the original calculations and findings contained within the Subramanian and Soh (2009) research study, as well as calculations and findings of this research study, were supported by PLS-SEM.



**Figure 6.** Original Subramanian and Soh (2009) – Inducement-Opportunity Framework on EKR Usage by Knowledge Contributors

A graphical summary of the structural model results arising from the PLS analysis of the Inducement-Opportunity Framework on EKR usage by knowledge contributors is as shown in Figure 7. This graphical summary reflects the data collected from 180 software developers in the employ of a single international software development company. The path coefficient values,  $\rho$  values (significance levels), as well as the coefficients of determination ( $R^2$  values) depicted with the graphical model are as stated in the results and findings reported by Subramanian and Soh (2009).



**Figure 7.** Original Subramanina and Soh (2009) Model Results – PLS Analysis of the Inducement-Opportunity Framework on EKR Usage by Knowledge Contributors (N=180 Software Developers from an international software development company)

A summary of the structural model proposition results and reliability testing using the Inducement-Opportunity Framework advanced by Subramanian and Soh (2009) – as well as the data collected from the 525 participants in this Inducement-Willingness-Opportunity framework research study is as shown in Table 16. In reviewing these results, it is important to note that in both the Subramanian and Soh (2009) research study, as well as in this Inducement-Willingness-Opportunity framework research study, the relationship between power (PWR) and inducement (IND) was shown to be non-significant. Conversely, there are mixed results when conducting a similar comparison in the relationship between inducement (IND) and use of an EKR (KMS), when applying the data collected from the 525 participants in the Inducement-Willingness-Opportunity

framework. Within the Inducement-Willingness-Opportunity framework advance in this research study, the inducement -> usage of EKR (KMS) relationship is determined to be non-significant. In the Inducement-Opportunity framework advanced by Subramanian and Soh (2009), the opposite is calculated as being true. The relationship between inducement and the usage of EKR (KMS) is determined to be positively significant. The data supporting this research study has been closely examined, the model constructs and constructs items examined as well as verified; the variance in the calculations can only be attributed to the variance native (& recognized as such) within the SmartPLS Version 3.2.6 application. It is noteworthy that the literature is mixed as to whether or not inducements are a factor/motivator in the use of EKR as well as KMS (Bock & Kim, 2002; Bock et al., 2005; Cheng et al., 2007; Kwok & Gao, 2005; Lin, 2007a; 2007b).

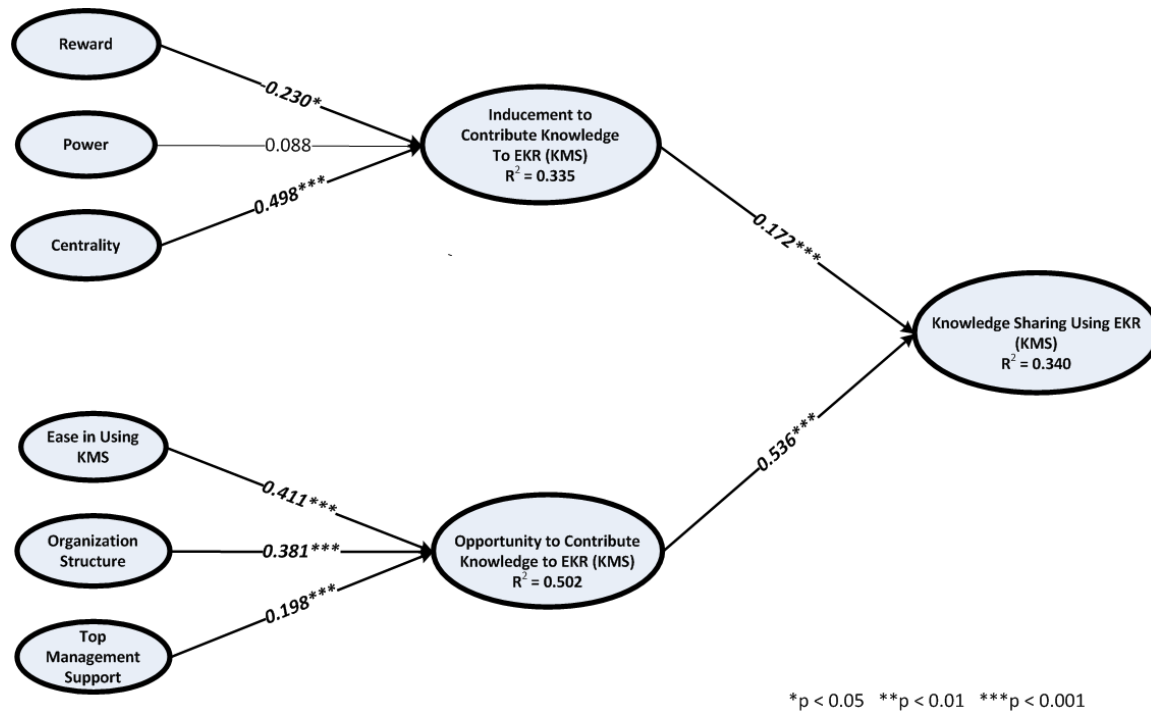
**Table 16.** Subramanian and Soh (2009) – Summary of Proposition Results and Reliability – this study 525 Knowledge Contributors (Intelligence Analysts) from the USG IC

<b>Relations:</b>	<b>Path Coefficients</b>	<b><math>\tau</math> - Statistics</b>	<b><math>\rho</math> - Statistics</b>	<b>+ or - Relationship</b>	<b>Supported</b>
REW -> IND	-0.230	2.155	<b>0.032*</b>	<b>Significant -</b>	<b>Yes</b>
PWR -> IND	0.088	1.392	0.165	Non-Significant +	No
CTR -> IND	0.498	10.795	<b>0.000***</b>	<b>Significant +</b>	<b>Yes</b>
EOU -> OPP	0.411	10.797	<b>0.000***</b>	<b>Significant +</b>	<b>Yes</b>
OS -> OPP	0.381	8.133	<b>0.000***</b>	<b>Significant +</b>	<b>Yes</b>
TMS -> OPP	0.198	4.149	<b>0.000***</b>	<b>Significant +</b>	<b>Yes</b>
IND -> USE	0.172	4.757	<b>0.000***</b>	<b>Significant +</b>	<b>Yes</b>
OPP -> USE	0.536	15.737	<b>0.000***</b>	<b>Significant +</b>	<b>Yes</b>

\*p < 0.05; \*\* p < 0.01; \*\*\* p < 0.001

A graphical representation of Table 16 – reflecting the Subramanian and Soh (2009) Inducement-Opportunity structural framework results – using PLS-SEM and the data collected from this research study involving 525 knowledge contributors from the USG IC, is as shown in Figure 8. It should be noted that the results comparison between the Subramanian and Soh (2009) structural model - using their data collected from 180

software developers, and this research study – the data collected from 525 intelligence analysts would appear to be mutually supportive (i.e., in agreement). However, upon closer inspection, it can be seen that path relationships are significantly stronger (indicating higher levels of predictive accuracy approaching the “moderate” category of significance) in this research study than that reported within the Subramanian and Soh (2009) (Hair et al., 2017). It should also be noted that this research study has applied a much more rigorous standard to significance level measurements in results reporting (i.e., levels defined as: \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ ) than those ascribed within the research study conducted by Subramanian and Soh (2009) (i.e., \* $p < 0.1$  \*\* $p < 0.05$  \*\*\* $p < 0.01$ ).



**Figure 8.** Subramanian and Soh (2009) Model Results Using PLS – this study of 525 Knowledge Contributors (Intelligence Analysts) from the USG IC

## Summary of Results

This chapter outlined the data analysis and the detailed results of this research study. The chapter began with a discussion of the research problem this study addressed, as well as the main goal of this research study. This chapter also addressed the anonymous survey instrument validation procedures employed to underpin the data collection supporting this research study, and discussing the makeup, characteristics, as well as role and responsibilities of the expert panel members.

This chapter addressed the population surveyed, the data collection and analysis efforts, including the issues of response rate, pre-analysis data screening, description of the study participants, as well as the result of the reliability analysis. This chapter examined the results of the *investigative* portion of this study, focusing on the new constructs introduced within this research study: *trust*, *collaborative environment*, *resistance to knowledge sharing*, as well as the impact of *inducement* and *opportunity* on an *individual's willingness* to share knowledge through a KMS. This chapter also examined the *confirmatory* portion of this research study (as advanced by Subramanian & Soh, 2009) wherein the impact of (including the constructs of *reward*, *power*, & *centrality*) as well as *opportunity* (encompassing the constructs of *ease of use*, *organization structure*, & *top management support*) was assessed as factors in one's willingness to contribute to a knowledge-sharing repository. This chapter concludes with an overall summary of the results of this study.

The research problem this study addressed is the challenge of maintaining strong organizational effectiveness and productivity through the use of KMS (Beer & Nohria, 2000; Benbya & Belbaly, 2005; Burley & Pandit, 2009; Furner et al., 2009). The main

goal of this study was to empirically assess a conceptual model to test the impact of the factors of *reward, power, centrality, trust, collaborative environment, resistance to share, ease-of-using KMS, organization structure, and top management support to inducement, willingness to share*, as well as *opportunity* to contribute knowledge to a KMS on knowledge-sharing in the context of the highly classified and sensitive environment of the USG IC.

This study builds upon the impact of the *inducement* and *opportunity* factors encompassed with the Subramanian and Soh (2009) theoretical model. This study also assessed the impact of inducements and opportunity factors on an individual's *willingness to share* in contributing knowledge to a KMS (Boland et al., 1994). In this research study, a new research model was proposed centering on a new set of constructs focused on an intelligence analyst's willingness to contribute his/her knowledge to a KMS (Devaraj & Kohli, 2003; Faniel & Majczak, 2002). These new constructs were: the degree or measure of *Trust* imbued in the KMS, the creation and sustainment of a *Collaborative Environment*, and an examination of an analyst's *Resistance to Share* in a collaborative environment supported by KMS (Burkhardt & Brass, 1990; Constant et al., 1996).

#### *Main Research Question*

The main research question this study addressed was: What is the impact of the factors of *reward, power, centrality, trust, collaborative environment, resistance to share, ease-of-using KMS, organization structure, and top management support to inducement, willingness to share*, as well as *opportunity* to contribute knowledge to KMS on knowledge sharing in a highly classified and sensitive environment? The main research

question that this study addressed was defined by three distinct investigative elements: (1) the degree of *trust* that a contributor has in his colleagues; and, within the boundaries of the organization's culture, the perceived employee's level of *trust* the contributor has ascribed to his organization's leadership and management; (2) the evolving boundaries of the *collaborative environment* in which the individual operates; and, (3) the contributor's innate *resistance to sharing* knowledge. All three aspects contribute to the contributor's *willingness* to share knowledge and to, ultimately, contribute to the organization's KMS.

This research study was a confirmatory empirical investigation examining the challenge of maintaining strong organizational effectiveness and productivity through the use of KMS (Beer & Noharia, 2000). The results of this research study build the impact of the inducement factors encompassed within the Subramanian and Soh (2009) theoretical model, the constructs of reward, power, centrality, organization structure, and top management support. This research study also examined the opportunities to moderate (*influence*) these factors, as well assess the impact on an individual's willingness to share knowledge for the purpose of establishing/facilitating a KMS in a highly classified and sensitive environment (Boland et al., 1994).



## Chapter 5

### Conclusions, Implications, Recommendations, and Summary

#### **Conclusions**

This chapter provides the conclusions, implications, recommendations for future research, as well as a summary of the results realized through the execution of this research study. A synopsis of the research problem, the main goal of the study, research methodology, a review of the propositions examined, and a summary of the study findings are included. A discussion of the strengths, weaknesses, and limitations of this study, implications of this study, and recommendations for future research are examined as well as this study's contribution to the body of knowledge. This chapter concludes with a summary of this research study.

#### **Implications**

The relevance of this research study is that it both supports and contributes to the body of knowledge related to the challenge of maintaining strong organizational effectiveness and productivity through the use of a KMS (Beer & Nohria, 2000). The purpose of a KMS is "to support the creation, transfer, and application of knowledge in organizations" (Alavi & Leidner, 2001, p. 107). The research literature pertaining to the development and implementation of KMS is both rich and extensive encompassing a number of research disciplines (Fuller, 2002; Tuomi, 2002; Firestone & McElroy, 2003). Peachey et al. (2005) have compiled a compendium of KM research studies reflecting publication in a wide variety of discipline-related journals including management,

hospitality, health care, economics, and IS. Of note, the dominant trend of the published research centers is concentrated on *knowledge transfer*, irrespective of the discipline/business function supported by KM or a KMS (Peachey et al., 2005). In this research study – *knowledge transfer* as supported by a KMS – was examined in a highly classified and sensitive environment.

To be credible, knowledge sharing research and development should both preserve as well as build upon the significant literature that exists in separate but related fields (Stein & Zwass, 1995; Kühn & Abecker, 1997). The focus of this study was to address the question, ‘Does the supporting KMS motivate an individual to provide knowledge for sharing’ (Hendricks, 1999; Pee et al., 2010; Tissen et al., 2000)? Within the IC operational environment, providing a tangible and timely solution to that question is the critical requirement (Flynn et al., 2010). The multi-faceted answer to that question has been thoroughly investigated, and a credible response formulated as a result of this study.

Equally important are the knowledge gaps in literature that are being mitigated by this research study. Within literature, there is the assumption that knowledge harvesting, as well as knowledge sharing, will occur naturally and automatically as a consequence of the knowledge harvesting processes, collaborative processes, as well as KMS technologies being in place (Kankanhalli et al., 2005). This research study demonstrates that once the human element is introduced into the equation, this assumption becomes improbable (Heiman & Nickerson, 2004; van den Hooff et al., 2012).

This research study has succeeded in better defining the concept of *willingness* that has proven difficult to isolate within literature (May et al., 2004). This is an

important outcome of this study as the definition of willingness, within literature, is generally taken for granted and – when discussed – is normally context specific (Kahn, 1990; May et al., 2004). Of major import – as corroborated by this study – is that willingness is a “multi-dimensional construct,” meaning that it is a property that can be influenced (Héliot & Riley, 2010, p. 402).

Although considerable management practice literature has been published focused on incentives introduced into a collaborative environment structured to motivate knowledge workers to share knowledge as well as expertise, a definitive knowledge gap exists with respect to inducements used in support of the use of KMS (Huber, 2001; Osterloh & Frey, 2000). Knowledge management literature is also replete with research conducted in the use of motivators (e.g., rewards & incentives) to encourage knowledge sharing (Bartol & Srivastava, 2002; Kankanhalli et al., 2005; Subramainian & Soh, 2009). A closer examination of the results published in underscores the indeterminate value that motivators have – as causal factors – underpinning a knowledge worker’s motivation for contributing to knowledge sharing through a KMS (Balkin & Gomez-Mejia, 1987; Shin, 2004; Simonin, 1999; Spender & Grant, 1996). This research study adds clarity to the value of intrinsic/extrinsic motivators – as causal factors – in a knowledge worker’s willingness to contribute his/her knowledge to a KMS.

Making the survey instrument supporting this research study available to other researchers will facilitate three outcomes related to the generalizability of the results. First, it will allow researchers to make time- and place-specific observations, thereby increasing confidence in the findings starting with the testing of the research model offered in this study. Second, it will allow other researchers to move from observation to

ascribing confidence in the theories and propositions presented in this research study.

Third, using appropriate quantitative analysis tools, the methodology and findings of this research study may be used to make predictions based upon recurring experience (Best et al., 2001).

The major strength of this research study is the due diligence paid to ensure the quality of the data collected and used in support of this study. In addition to serving in critical advisory role in the both the preparation and administration of the survey instrument, this research study's expert panel, established a communications plan to engage IC intelligence analyst participation. No doubt the expert panel's active support contributed to the significant number of participants (with OEF &/or OIF intelligence analyst experience) who contributed their time to this research study.

## **Limitations and Recommendations for Future Research**

### *Limitations of this Research*

According to Ellis and Levy (2009), a study limitation is defined as an "uncontrollable threat to the internal validity of the study" (p. 332). This study, like any other research, has some limitations. One key limitation of this study is that its respondent population has been restricted to intelligence analysts who were, or are currently, employed by the USG in military related environments. Similar, highly-classified environments in federal law-enforcement or other non-US perspectives may be somewhat different. Another limitation is that this study is focused on intelligence analysts who have used a KMS in support of Operation Enduring Freedom and/or Operation Iraqi Freedom, thus, if new systems have been developed since that

perspective hasn't been captured in this study. An additional limitation is that the results of this study might be biased by the USG IC's organizational culture (Central Intelligence Agency, 2005). The organizational context chosen for study would also limit the generalizability of the results achieved. The IC, as a culture, places greater value on tacit knowledge than explicit knowledge (Central Intelligence Agency, 2005). Future studies in different research contexts would contribute to understanding the generalizability of the research model underpinning this study.

Another limitation of this study was access to the anonymous survey instrument. As administered, the survey instrument was only accessible through a commercial (i.e., public) unclassified Website. Many USG IC environments restrict access to unclassified and public Websites from work site locations. In these cases, the survey respondents were required to complete the survey from home or some other non-work site location. These factors may have influenced the survey results.

#### *Recommendations for Future Research*

Built upon the initial research of Subramanian and Soh (2009), this research study amplifies and expands upon their findings. This research study is a product of the portability as well reproducibility built into their initial study – amplified and expanded in this research study. The structural model advanced within this research study can be exercised by any organization or activity that (arguably) ties its success to the effectiveness and productivity that can be achieved by/through a technology-based knowledge sharing solution. As demonstrated in both studies – Subramanian and Soh (2009) – who surveyed a population of 180 software developers, and this study - that surveyed a population of 525 intelligence analysts – the business functions or

organizational cultures may differ, but the structural model can be leveraged. Engineering organizations, as well as research and development activities, would both be ideal setting for future study into organizational effectiveness and productivity realized through a collaborative KMS.

Of note, although demographic information was collected on the 525 intelligence analysts who participated in this study, an analysis of the demographic information collected was not a part of this research initiative due to the nature of the sample collected, where no such information can be shared with the public (Central Intelligence Agency, 2005). In future research initiatives, using the research model validated in this study, demographic information could be collected to support a longitudinal study focused on the collaborative activities of a specific group.

### **Summary**

The research problem this study addressed is the challenge of maintaining strong organizational effectiveness and productivity through the use of KMS (Beer & Nohria, 2000; Benbya & Belbaly, 2005; Burley & Pandit, 2009; Furner et al., 2009). The main goal of this study was to empirically assess a conceptual model to test the impact of the factors of *reward, power, centrality, trust, collaborative environment, resistance to share, ease-of-using KMS, organization structure, and top management support to inducement, willingness to share*, as well as *opportunity* to contribute knowledge to a KMS on knowledge-sharing in the context of the highly classified and sensitive environment of the USG IC.

This study builds upon the impact of the *inducement* and *opportunity* factors encompassed with the Subramanian and Soh (2009) theoretical model. This study also

assessed the impact of inducements and opportunity factors on an individual's *willingness to share* in contributing knowledge to a KMS (Boland et al., 1994). In this research study, a new research model was proposed centering on a new set of constructs focused on an intelligence analyst's willingness to contribute his/her knowledge to a KMS (Devaraj & Kohli, 2003; Faniel & Majczak, 2002). These new constructs were: the degree or measure of *Trust* imbued in the KMS, the creation and sustainment of a *Collaborative Environment*, and an examination of an analyst's *Resistance to Share* in a collaborative environment supported by KMS (Burkhardt & Brass, 1990; Constant et al., 1996).

The main research question this study addressed was: What is the impact of the factors of *reward, power, centrality, trust, collaborative environment, resistance to share, ease-of-using KMS, organization structure, and top management support to inducement, willingness to share*, as well as *opportunity* to contribute knowledge to KMS on knowledge sharing in a highly classified and sensitive environment? The main research question that this study addressed was defined by three distinct investigative elements: (1) the degree of *trust* that a contributor has in his colleagues; and, within the boundaries of the organization's culture, the perceived employee's level of *trust* the contributor has ascribed to his organization's leadership and management; (2) the evolving boundaries of the *collaborative environment* in which the individual operates; and, (3) the contributor's innate *resistance to sharing* knowledge. All three aspects contribute to the contributor's *willingness* to share knowledge and to, ultimately, contribute to the organization's KMS.

This research study was a confirmatory empirical investigation examining the challenge of maintaining strong organizational effectiveness and productivity through the

use of KMS (Beer & Noharia, 2000). The results of this research study build the impact of the inducement factors encompassed within the Subramanian and Soh (2009) theoretical model, the constructs of reward, power, centrality, organization structure, and top management support. This research study also examined the opportunities to moderate (*influence*) these factors, as well assess the impact on an individual's willingness to share knowledge for the purpose of establishing/facilitating a KMS in a highly classified and sensitive environment (Boland et al., 1994).

### *Research Propositions*

The 14 specific research propositions addressed in this confirmatory and investigative research study, as well as each proposition's corresponding results, is outlined as follows:

P1a: An employee's perceived *reward* will demonstrate a significant positive influence on his/her *inducement* to contribute knowledge to the KMS. **Supported: YES**

P1b: An employee's perceived increase in *power* within the organization will demonstrate a significant positive influence on his/her *inducement* to contribute to the KMS. **Supported: No**

P1c: An employee's perception of increased *centrality* within the collaborative hierarchy will demonstrate a significant positive influence on his/her *inducement* to contribute to the KMS. **Supported: YES**

P2a: An employee's perceived *trust* in a collaborative environment will demonstrate a significant positive influence on his/her *willingness* to contribute knowledge to the KMS. **Supported: YES**



- P2b: An employee's perceived value of a *collaborative environment* within the organization will demonstrate a significant positive influence on his/her *willingness* to contribute to the KMS. **Supported: YES**
- P2c: An employee's perceived *resistance to share* within a collaborative environment will demonstrate a significant negative influence on his/her *willingness* to contribute to the KMS. **Supported: YES**
- P3a: An employee's perceived *ease of use* in the supporting technology within the collaborative environment will demonstrate a significant positive influence on his/her *opportunity* to contribute knowledge to the KMS. **Supported: YES**
- P3b: An employee's perceived value of a *supportive organization structure* will demonstrate a significant positive influence on his/her *opportunity* to contribute to the KMS. **Supported: YES**
- P3c: An employee's perceived value *top management support* of the collaborative environment by will demonstrate a significant negative influence on his/her *opportunity* to contribute to the KMS. **Supported: YES**
- P4: An employee's *inducement* to contribute knowledge to the KMS will demonstrate a significant positive influence on his/her knowledge sharing using KMS. **Supported: NO**
- P5: An employee's *willingness* to contribute to the KMS will demonstrate a significant positive influence on his/her knowledge sharing using KMS. **Supported: YES**
- P6: An employee's *opportunity* to contribute to the KMS will demonstrate a significant positive influence on his/her knowledge using KMS. **Supported: YES**

P7: An employee's *individual willingness inducement* to contribute to the KMS will demonstrate a significant positive influence on his/her *willingness* to contribute knowledge to the KMS. **Supported: No**

P8: An employee's *individual willingness opportunity* to contribute to the KMS will demonstrate a significant positive influence on his/her *willingness* to contribute knowledge to the KMS. **Supported: YES**

As recognized by Flynn et al. (2009) the results of this research will be of great interest to the USG IC community as well as its KM practitioners who have significant equities in knowledge harvesting, knowledge sharing, collaboration, as well as KMS operating in a highly classified and sensitive environment. Additionally, the content of this chapter argues that the results from this study will contribute to the body of knowledge concerning the identification and understanding of the fundamental factors motivating knowledge workers to contribute to knowledge harvesting in support of KMS.

## APPENDIX A

### Survey Instrument

#### **General Instructions**

Dear Survey Participant -

Thank you for your willingness to participate in this survey.

I am a Ph.D. student at Nova Southeastern University conducting research for my dissertation that will investigate Intelligence Analysts' perception of Knowledge Management Systems (KMS) within a highly classified and sensitive environment. My doctoral supervisor for this study is Dr. Yair Levy, a Professor within the College of Engineering and Computing at Nova Southeastern University.

As a survey participant, your identity, as well as all survey responses, will be kept anonymous. Additionally, no personally identifiable information will be asked of, or collected from, a survey participant. Information provided in the survey will be completely anonymous, and data will only be published on aggregated form. Most importantly, participation in this survey is voluntary and, you may exit (i.e., opt-out) of the survey instrument at any time.

Please ensure that you answer all survey questions. When complete, please ensure that you hit the "Submit" button to record your participation in the survey. When survey execution and submission is complete, you will receive an on-screen acknowledgement.

Again, thank you for your participation in this survey.

Sincerely,

Robert J. Hambly, Jr., Ph.D. Candidate  
Nova Southeastern University

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**Section 1. Demographics Information: Would you please take a moment and tell us a little more about yourself?**

**D1. What is your gender?**

[Select One]

1	2
Male <input type="checkbox"/>	Female <input type="checkbox"/>

**D2. What is your age?**

[Select One]

1	2	3	4	5	6	7
25 or Under <input type="checkbox"/>	26 – 35 <input type="checkbox"/>	36 – 45 <input type="checkbox"/>	46 – 55 <input type="checkbox"/>	56 – 65 <input type="checkbox"/>	66 – 75 <input type="checkbox"/>	76 or Older <input type="checkbox"/>

**D3. What is your current employment category?**

[Select One]

1	2	3	4	5
Military <input type="checkbox"/>	Government Civilian <input type="checkbox"/>	Contractor <input type="checkbox"/>	Unemployed <input type="checkbox"/>	Retired <input type="checkbox"/>

**D4. Total years of service (work experience) in all employment categories?**

[Select One]

1	2	3	4	5	6	7	8	9
Less than 1 year <input type="checkbox"/>	1 – 5 years <input type="checkbox"/>	6 – 10 years <input type="checkbox"/>	11 – 15 years <input type="checkbox"/>	16 – 20 years <input type="checkbox"/>	21 – 25 years <input type="checkbox"/>	26 – 30 years <input type="checkbox"/>	31 – 35 years <input type="checkbox"/>	More than 35 years <input type="checkbox"/>

**D5. As a current or former Intelligence Analyst, did you use a technology-based Knowledge Management Systems (KMS)?**

1	2	3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<b>Yes</b> <input type="checkbox"/>	<b>No</b> <input type="checkbox"/>	<b>Not Sure</b> <input type="checkbox"/>
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**D6. If you are a CURRENT or FORMER Intelligence Analyst, which of the following technology-based Knowledge Management System (KMS) solutions do you/did you employ in your workplace? [Select All That Apply]**

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>Decision Support Systems (DSS)</b>  <input type="checkbox"/>	<b>Lessons-Learned Databases /Systems</b>  <input type="checkbox"/>	<b>Portals</b>  <input type="checkbox"/>	<b>Groupware</b>  <input type="checkbox"/>	<b>Communities of Practice</b>  <input type="checkbox"/>	<b>Data Centers /Fusion Centers</b>  <input type="checkbox"/>
<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	
<b>Expert Systems</b>  <input type="checkbox"/>	<b>Talent Management Systems</b>  <input type="checkbox"/>	<b>Cloud-based Collaborative Systems/Services</b>  <input type="checkbox"/>	<b>Other</b>  <input type="checkbox"/>	<b>Do Not/Did Not Use a Technology-Based KMS</b>  <input type="checkbox"/>	

**D7. Total years of experience in the use of Knowledge Management Systems (KMS)? [A KMS is a class of information system supporting knowledge storage, retrieval, and knowledge sharing.]**

**[Select One]**

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>Less than 1 year</b> <input type="checkbox"/>	<b>1 – 5 years</b> <input type="checkbox"/>	<b>6 – 10 years</b> <input type="checkbox"/>	<b>11 – 15 years</b> <input type="checkbox"/>	<b>16 – 20 years</b> <input type="checkbox"/>	<b>21 – 25 years</b> <input type="checkbox"/>	<b>More than 25 years</b> <input type="checkbox"/>

**D8. Years of service (work experience) using KMS in support of Operation Enduring Freedom (OEF)? (Afghanistan) [A KMS is a class of information system supporting knowledge storage, retrieval, and knowledge sharing.]**

**[Select One]**

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>None</b> <input type="checkbox"/>	<b>Less than 1 year</b> <input type="checkbox"/>	<b>1 – 3 years</b> <input type="checkbox"/>	<b>4 – 7 years</b> <input type="checkbox"/>	<b>8 – 10 years</b> <input type="checkbox"/>	<b>More than 10 years</b> <input type="checkbox"/>

**D9. Years of service (work experience) using KMS in support of Operation Iraqi Freedom (OIF)? (Iraq)** [A KMS is a class of information system supporting knowledge storage, retrieval, and knowledge sharing.]

[Select One]

1	2	3	4	5	6
None <input type="checkbox"/>	Less than 1 year <input type="checkbox"/>	1 – 3 years <input type="checkbox"/>	4 – 7 years <input type="checkbox"/>	8 – 10 years <input type="checkbox"/>	More than 10 years <input type="checkbox"/>

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Definition: A Knowledge Management System (KMS) is generally a class of information technology-based systems for managing knowledge within organizations facilitating knowledge creation, capture, storage, retrieval, and knowledge sharing.

**Section 2. Reward.** [Reward is defined as “the importance of economic incentives provided for knowledge contribution; a thing given in recognition of one’s service, effort, or achievement”.]

Please respond to the following statements from “1” to “7”, with “1” indicating “Strongly Disagree” and “7” indicating “Strongly Agree.”

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Agree	Strongly Agree

<b>REW1</b>	I will get a higher salary when I contribute my knowledge to a KMS.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>REW2</b>	I will get a higher bonus when I contribute my knowledge to a KMS.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>REW3</b>	I will get a better work assignment when I contribute my knowledge to a KMS.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>REW4</b>	I will get promoted when I contribute my knowledge to a KMS.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>REW5</b>	I will get a reward when I contribute my knowledge to a KMS.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>REW6</b>	I will get better job security when I contribute my knowledge to a KMS.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>

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**Section 3. Power.** [Power is defined as “the ability or right to control people and/or things; the degree to which one believes that he/she can increase power and value gained due to a knowledge contribution.”]

Please respond to the following statements from “1” to “7”, with “1” indicating “Strongly Disagree” and “7” indicating “Strongly Agree.”

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Agree	Strongly Agree

<b>PWR1</b>	My respect within the organization will improve when I contribute my knowledge to a KMS.	1	2	3	4	5	6	7
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>PWR2</b>	My value within the organization will improve when I contribute my knowledge to a KMS.	1	2	3	4	5	6	7
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>PWR3</b>	My status within the organization will improve when I contribute my knowledge to a KMS.	1	2	3	4	5	6	7
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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**Section 4. Centrality.** [Centrality is defined as “the degree to which one believes one can increase in-degree and closeness to others within the organization (establishing oneself in a position of influence) because of knowledge contributions to the organization; the quality or state of being central; tendency to remain in or at the center.”]

Please respond to the following statements from “1” to “7”, with “1” indicating “Strongly Disagree” and “7” indicating “Strongly Agree.”

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Agree	Strongly Agree

<b>CTR1</b>	When I contribute my knowledge to a KMS, I will gain a closer working relationship with others.	1	2	3	4	5	6	7
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>CTR2</b>	When I contribute my knowledge to a KMS, I will be consulted by others more.	1	2	3	4	5	6	7
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>CTR3</b>	When I contribute my knowledge to a KMS, I will gain greater access to people, information, and other resources.	1	2	3	4	5	6	7
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

---

**Section 5. Inducement.** [Inducement is defined as “a motive or consideration that leads one to action, or to additional or more effective actions as measured by the user’s willingness to contribute knowledge.”]

Please respond to the following statements from “1” to “7”, with “1” indicating “Strongly Disagree” and “7” indicating “Strongly Agree.”

1	2	3	4	5	6	7
<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Somewhat Disagree</b>	<b>Neither Agree or Disagree</b>	<b>Somewhat Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>

<b>IND1</b>	I will share my knowledge and expertise with other Intel Analysts by contributing to a KMS.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>IND2</b>	I will contribute my knowledge to a KMS, because I can help another Intel Analyst solve job-related problems, improve work effectiveness and productivity, or make a difference to the organization.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>

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**Section 6. Trust.** [Trust is defined as “a person’s willingness to depend on another individual’s actions that involve opportunism.” Trust is the probability that he (or she) will perform an action that is beneficial – or at least not detrimental to us – and is high enough for us to consider engaging in some form of cooperation with him (or her). A belief that someone or something is reliable, good, honest, effective, etc.; assured reliance on the character, ability, strength, or truth of someone or something.”]

**Please respond to the following statements from “1” to “7”, with “1” indicating “Strongly Disagree” and “7” indicating “Strongly Agree.”**

1	2	3	4	5	6	7
<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Somewhat Disagree</b>	<b>Neither Agree or Disagree</b>	<b>Somewhat Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>

<b>TR1</b>	I believe that Intel Analysts in my organization give credit for another Intel Analyst’s knowledge and expertise where it is due.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>TR2</b>	I believe that Intel Analysts in my organization use other Intel Analyst’s knowledge appropriately.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>TR3</b>	I believe that Intel Analysts in my organization share the best knowledge that they have.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>

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**Section 7. Collaborative Environment.** [A Collaborative Environment is defined as “the use of information technologies specially designed to support human interaction and teamwork.” It is a working environment that supports people (e.g., professionals) in their individual and cooperative work. A collaborative environment allows two or more



participants to communicate, coordinate, and collaborate to accomplish a shared objective.”]

**Please respond to the following statements from “1” to “7”, with “1” indicating “Strongly Disagree” and “7” indicating “Strongly Agree.”**

1	2	3	4	5	6	7
<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Somewhat Disagree</b>	<b>Neither Agree or Disagree</b>	<b>Somewhat Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>

<b>CE1</b>	When I contribute my knowledge to a KMS for the purpose of helping another Intel Analyst, I expect nothing in return.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>CE2</b>	When I contribute my knowledge to a KMS for the purpose of helping another Intel Analyst, I expect reciprocity (something in return) should the need arise.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>

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**Section 8. Resistance to Share.** [Resistance to Share (Knowledge Sharing) is defined as “the competitive individualism, supporting individual effort and ability, that does not support cooperation and the sharing of expertise.” Not wanting to share knowledge speaks a lot about the interests (sometimes conflicting and competing) of people in the organization.]

**Please respond to the following statements from “1” to “7”, with “1” indicating “Strongly Disagree” and “7” indicating “Strongly Agree.”**

1	2	3	4	5	6	7
<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Somewhat Disagree</b>	<b>Neither Agree or Disagree</b>	<b>Somewhat Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>

<b>RKS1</b>	I do not contribute my knowledge to a KMS because I believe I will open myself to criticism or ridicule.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>RKS2</b>	I do not contribute my knowledge to a KMS because I believe that I have not “earned the right” to do so.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>RKS3</b>	I do not contribute my knowledge to a KMS because most information requests from other Intel Analysts are not clear as to what information is requested/required.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>RKS4</b>	I do not contribute my knowledge to a KMS because my contributions require a time-consuming “manager review”.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>

<b>RKS5</b>	I do not contribute my knowledge to a KMS because of confidentiality/security concerns.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>RKS6</b>	I do not contribute my knowledge to a KMS because if I make a mistake I will be punished.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>RKS7</b>	I do not contribute my knowledge to a KMS because most other Intel Analysts can contribute more valuable knowledge to a KMS than I can.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>

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**Section 9. Willingness to Contribute.** [Willingness is defined as “related to an individual’s calculations of advantages and disadvantages, cost and benefit, considered on both a conscious and unconscious level. Through willingness, an individual recognizes opportunities and then translates those opportunities into alternatives that are weighed/weighted in some manner. Quick to act or respond.” Doing something or willing to do something without being persuaded. Inclined or favorably disposed in mind; ready, willing, and eager to help.]

Please respond to the following statements from “1” to “7”, with “1” indicating “Strongly Disagree” and “7” indicating “Strongly Agree.”

1	2	3	4	5	6	7
<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Somewhat Disagree</b>	<b>Neither Agree or Disagree</b>	<b>Somewhat Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>

<b>WIL1</b>	I would allow another Intel Analyst to spend significant time observing and collaborating with me, through a KMS, in order for him/her to better understand and learn from my work.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>WIL2</b>	I would willingly share with another Intel Analyst, through a KMS, what I have learned in terms of rules of thumb, tricks of the trade, and other insights into the work of my organization.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>WIL3</b>	I would willingly share my new ideas with another Intel Analyst through a KMS.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>WIL4</b>	If relevant to my work, I would welcome the opportunity to spend significant time with another Intel Analyst observing and collaborating with this individual, through a KMS, in order for me to better understand and learn from his/her work.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>WIL5</b>	I would welcome and use, through a KMS, any rules of thumb, tricks of the trade, and other insights another Intel Analyst has learned.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>

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**Section 10. Ease of Use as a factor for contributing knowledge to a Knowledge Management System (KMS).** [Ease of Use is defined as “the degree to which technology is perceived to be free of effort. The ability of a user to readily and successfully perform a task without the need for an advanced explanation and/or the instruction manual.”]

Please respond to the following statements from “1” to “7”, with “1” indicating “Strongly Disagree” and “7” indicating “Strongly Agree.”

1	2	3	4	5	6	7
<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Somewhat Disagree</b>	<b>Neither Agree or Disagree</b>	<b>Somewhat Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>

<b>EOU1</b>	The KMS I use for contributing my knowledge is easy to learn.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>EOU2</b>	The KMS I use for contributing my knowledge is easy to use.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>EOU3</b>	The KMS procedures I use for contributing my knowledge are clear and understandable.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>

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**Section 11. Organization Structure.** [Organization Structure is defined as “how activities such as task allocation, coordination, and supervision are directed towards the achievement of organizational aims. It can also be considered as the lens or perspective through which individuals see their organizations and its environment.”]

Please respond to the following statements from “1” to “7”, with “1” indicating “Strongly Disagree” and “7” indicating “Strongly Agree.”

1	2	3	4	5	6	7
<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Somewhat Disagree</b>	<b>Neither Agree or Disagree</b>	<b>Somewhat Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>

<b>OS1</b>	My organization encourages interaction among employees for the purpose of knowledge sharing.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>OS2</b>	My organization values ideas for their merit rather than the source.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>OS3</b>	My organization promotes collective (collaborative) rather than individualistic behavior.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>OS4</b>	My organization is open to conflicting views in the sharing of knowledge.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>

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**Section 12. Top Management Support.** [Top Management Support is defined as “Organizational Leadership devoting time to the KMS initiative in proportion to its cost and potential, reviewing plans and policy, following up on results achieved, and facilitating the management problems associated with integrating the KMS into the management processes of the business.”]

Please respond to the following statements from “1” to “7”, with “1” indicating “Strongly Disagree” and “7” indicating “Strongly Agree.”

1	2	3	4	5	6	7
<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Somewhat Disagree</b>	<b>Neither Agree or Disagree</b>	<b>Somewhat Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>

<b>TMS1</b>	Senior management promotes and supports knowledge sharing and collaboration through KMS.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>TMS2</b>	Senior management allocates requisite resources facilitating knowledge sharing and collaboration through KMS.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>TMS3</b>	Senior management has a norm of tolerance for mistakes made in knowledge sharing and collaboration through KMS.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>

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**Section 13. Opportunity.** [Opportunity is defined as “Perception of whether the user was given the chance to contribute knowledge or, whether they were constrained by any aspect of the organization in contributing knowledge. The possibilities available to any entity within any environment.”]

Please respond to the following statements from “1” to “7”, with “1” indicating “Strongly Disagree” and “7” indicating “Strongly Agree.”

1	2	3	4	5	6	7
<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Somewhat Disagree</b>	<b>Neither Agree or Disagree</b>	<b>Somewhat Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>

<b>OPP1</b>	My organization does not place any restraints or constraints on me with respect to knowledge sharing and/or collaboration using a KMS.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>OPP2</b>	My organization gives me sufficient opportunity to contribute my knowledge to a KMS.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>OPP3</b>	My organization is helpful to me in contributing my	1	2	3	4	5	6	7

knowledge to a KMS.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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**Section 14. Inducement and Willingness.** [Inducement is defined as “a motive or consideration that leads one to action, or to additional or more effective actions as measured by the user’s willingness to contribute knowledge.”] [Willingness is defined as “related to an individual’s calculations of advantages and disadvantages, cost and benefit, considered on both a conscious and unconscious level. Through willingness, an individual recognizes opportunities and then translates those opportunities into alternatives that are weighed/weighted in some manner and is quick to act or respond.” Doing something or willing to do something without being persuaded. Inclined or favorably disposed in mind; ready, willing, and eager to help.]

**Please respond to the following statements from “1” to “7”, with “1” indicating “Strongly Disagree” and “7” indicating “Strongly Agree.”**

1	2	3	4	5	6	7
<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Somewhat Disagree</b>	<b>Neither Agree or Disagree</b>	<b>Somewhat Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>

<b>IWI1</b>	Inducements do not influence my willingness to contribute my knowledge to a KMS in my work.	1	2	3	4	5	6	7
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>IWI2</b>	Inducements sometimes influence my willingness to contribute my knowledge to a KMS in my work.	1	2	3	4	5	6	7
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>IWI3</b>	Inducements frequently influence my willingness to contribute my knowledge to a KMS in my work.	1	2	3	4	5	6	7
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>IWI4</b>	Without Inducements I am not willing to contribute my knowledge to a KMS in my work.	1	2	3	4	5	6	7
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Section 15. Opportunity and Willingness.** [Opportunity is defined as “Perception of whether the user was given the chance to contribute knowledge or, whether they were constrained by any aspect of the organization in contributing knowledge. The possibilities that are available to any entity within any environment.”] [Willingness is defined as “related to an individual’s calculations of advantages and disadvantages, cost and benefit, considered on both a conscious and unconscious level. Through willingness, an individual recognizes opportunities and then translates those opportunities into alternatives that are weighed/weighted in some manner quick to act or respond.” Doing something or willing to do something without being persuaded. Inclined or favorably disposed in mind; ready, willing, and eager to help.]

Please respond to the following statements from “1” to “7”, with “1” indicating “Strongly Disagree” and “7” indicating “Strongly Agree.”

1	2	3	4	5	6	7
<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Somewhat Disagree</b>	<b>Neither Agree or Disagree</b>	<b>Somewhat Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>

<b>IWO1</b>	Given the opportunity, I am frequently willing to use a KMS to contribute my knowledge in my work.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>IWO2</b>	Given the opportunity, I am always willing to use a KMS to contribute my knowledge in my work.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>

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**Section 16. Usage of KMS.** [Usage is defined as “an individual’s belief in his/her ability to use computers (technology) in the determination of computer (technology) use when faced with a new or unfamiliar situation. The act of using something; a firmly established and generally accepted practice or procedure.]

Please respond to the following statements from “1” to “7”, with “1” indicating “Strongly Disagree” and “7” indicating “Strongly Agree.”

1	2	3	4	5	6	7
<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Somewhat Disagree</b>	<b>Neither Agree or Disagree</b>	<b>Somewhat Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>

<b>USE1</b>	I frequently use a KMS to contribute my knowledge in my work.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
<b>USE2</b>	I frequently use a KMS to contribute my expertise in my work.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>

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**Your responses have been recorded. We gratefully acknowledge your support of this important research effort. Thank you.**

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## APPENDIX B

## Mapping of Survey Instrument Items to Literature-based References

**Section 1** of the survey instrument encompasses the **demographic data** that is collected from each survey respondent. The demographic information collected provides the researcher with requisite data regarding the research participants. The collection of demographic data is necessary for the determination of whether the individuals in a particular study are a representative sample of the target population for generalization purposes.

**Section 2. Reward as a factor for Contributing Knowledge to Knowledge Management System (KMS) (Construct: REW).**

<b>Item</b>	<b>Operational Declaration: The importance of economic incentives (a thing given in recognition of one's service, effort, or achievement) for knowledge contributions to a KMS.</b>	<b>Operational References from Literature Supporting Survey Instrument Item</b>
<b>REW1</b>	I will get a higher salary when I contribute my knowledge to a KMS.	MacInnis, Moorman, & Jaworski, 1991; Hansen, Nohria, & Tierney, 1999; Ba, Stallaert, & Whinston, 2001; H. Hall, 2001; May, Korczynski, & Frenkel, 2002; Ferrin & Dirks, 2003; Liebowitz, 2003; Bock, Zmud, Kim, & Lee, 2005; Kankanhalli, Tan, & Wei, 2005; Cabrera, Collins, & Salgado, 2006; Kim & Lee, 2006; Taylor, 2006; Kulkarni, Ravindran, & Freeze, 2007; Yao, Kam, & Chau, 2007; Subramanian & Soh, 2009; Cryder, London, Volpp, & Lowenstein, 2010.
<b>REW2</b>	I will get a higher bonus when I contribute my knowledge to a KMS.	MacInnis, Moorman, & Jaworski, 1991; Hansen, Nohria, & Tierney, 1999; Ba, Stallaert, & Whinston, 2001; H. Hall, 2001; May, Korczynski, & Frenkel, 2002; Ferrin & Dirks, 2003; Liebowitz, 2003; Bock, Zmud, Kim, & Lee, 2005; Kankanhalli, Tan, & Wei, 2005; Cabrera, Collins, & Salgado, 2006; Kim & Lee, 2006; Taylor,

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		2006; Kulkarni, Ravindran, & Freeze, 2007; Yao, Kam, & Chau, 2007; Subramanian & Soh, 2009; Cryder, London, Volpp, & Lowenstein, 2010.
<b>REW3</b>	I will get a better work assignment when I contribute my knowledge to a KMS.	MacInnis, Moorman, & Jaworski, 1991; Hansen, Nohria, & Tierney, 1999; Ba, Stallaert, & Whinston, 2001; H. Hall, 2001; May, Korczynski, & Frenkel, 2002; Ferrin & Dirks, 2003; Liebowitz, 2003; Bock, Zmud, Kim, & Lee, 2005; Kankanhalli, Tan, & Wei, 2005; Cabrera, Collins, & Salgado, 2006; Kim & Lee, 2006; Taylor, 2006; Kulkarni, Ravindran, & Freeze, 2007; Yao, Kam, & Chau, 2007; Subramanian & Soh, 2009; Cryder, London, Volpp, & Lowenstein, 2010.
<b>REW4</b>	I will get promoted when I contribute my knowledge to a KMS.	MacInnis, Moorman, & Jaworski, 1991; Hansen, Nohria, & Tierney, 1999; Ba, Stallaert, & Whinston, 2001; H. Hall, 2001; May, Korczynski, & Frenkel, 2002; Ferrin & Dirks, 2003; Liebowitz, 2003; Bock, Zmud, Kim, & Lee, 2005; Kankanhalli, Tan, & Wei, 2005; Cabrera, Collins, & Salgado, 2006; Kim & Lee, 2006; Taylor, 2006; Kulkarni, Ravindran, & Freeze, 2007; Yao, Kam, & Chau, 2007; Subramanian & Soh, 2009; Cryder, London, Volpp, & Lowenstein, 2010.
<b>REW5</b>	I will get a reward when I contribute my knowledge to a KMS.	MacInnis, Moorman, & Jaworski, 1991; Hansen, Nohria, & Tierney, 1999; Ba, Stallaert, & Whinston, 2001; H. Hall, 2001; May, Korczynski, & Frenkel, 2002; Ferrin & Dirks, 2003; Liebowitz, 2003; Bock, Zmud, Kim, & Lee, 2005; Kankanhalli, Tan, & Wei, 2005; Cabrera, Collins, & Salgado, 2006; Kim & Lee, 2006; Taylor, 2006; Kulkarni, Ravindran, &

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		Freeze, 2007; Yao, Kam, & Chau, 2007; Subramanian & Soh, 2009; Cryder, London, Volpp, & Lowenstein, 2010.
<b>REW6</b>	I will get better job security when I contribute my knowledge to a KMS.	MacInnis, Moorman, & Jaworski, 1991; Hansen, Nohria, & Tierney, 1999; Ba, Stallaert, & Whinston, 2001; H. Hall, 2001; May, Korczynski, & Frenkel, 2002; Ferrin & Dirks, 2003; Liebowitz, 2003; Bock, Zmud, Kim, & Lee, 2005; Kankanhalli, Tan, & Wei, 2005; Cabrera, Collins, & Salgado, 2006; Kim & Lee, 2006; Taylor, 2006; Kulkarni, Ravindran, & Freeze, 2007; Yao, Kam, & Chau, 2007; Subramanian & Soh, 2009; Cryder, London, Volpp, & Lowenstein, 2010.

**Section 3. Power as a factor for Contributing Knowledge to Knowledge Management System (KMS) (Construct: PWR).**

<b>Item</b>	<b>Operational Declaration: The degree to which one believes s/he can increase individual power (the ability or right to control people or things) and value through knowledge contribution to a KMS.</b>	<b>Operational References from Literature Supporting Survey Instrument Item</b>
<b>PWR1</b>	My respect within the organization will improve when I contribute my knowledge to a KMS.	Bachrach & Baratz, 1962; Mulder, 1971; Astley & Sachdeva, 1984; Gupta & Govindarajan, 2000; Wasko & Faraj, 2000; Husted & Machilova, 2002; Kankanhalli, Tan, & Wei, 2005; Liao, 2008; Renzl, 2008; Subramanian & Soh, 2009; Fehr, Holger, & Wilkening, 2013.
<b>PWR2</b>	My value within the organization will improve when I contribute my knowledge to a KMS.	Bachrach & Baratz, 1962; Mulder, 1971; Astley & Sachdeva, 1984; Gupta & Govindarajan, 2000; Wasko & Faraj, 2000; Husted & Machilova, 2002; Kankanhalli, Tan, & Wei, 2005; Liao, 2008; Renzl, 2008; Subramanian & Soh, 2009; Fehr, Holger, & Wilkening,

		2013.
<b>PWR3</b>	My status within the organization will improve when I contribute my knowledge to a KMS.	Bachrach & Baratz, 1962; Mulder, 1971; Astley & Sachdeva, 1984; Gupta & Govindarajan, 2000; Wasko & Faraj, 2000; Husted & Machilova, 2002; Kankanhalli, Tan, & Wei, 2005; Liao, 2008; Renzl, 2008; Subramanian & Soh, 2009; Fehr, Holger, & Wilkening, 2013.

**Section 4. Centrality as a factor for Contributing Knowledge to Knowledge Management System (KMS) (Construct: CTR).**

<b>Item</b>	<b>Operational Declaration: The degree to which one believes s/he increases (improves) position as an organizational focal point or main figure (establishing oneself in a position of influence) through knowledge contribution to a KMS.</b>	<b>Operational References from Literature Supporting Survey Instrument Item</b>
<b>CTR1</b>	When I contribute my knowledge to a KMS, I will gain a closer working relationship with others.	Kelley, 1967; Hickson, Hinings, Schneck, & Pennings, 1971; Wofford, 1971; Pfeffer, 1981; Tushman & Romanelli, 1983; Astley & Sachdeva, 1984; Burkhardt & Brass, 1990; Bolino, 1999; Yli-Renko, Autio, & Sapienza, 2001; Subramanian & Soh, 2009.
<b>CTR2</b>	When I contribute my knowledge to a KMS, I will be consulted by others more.	Kelley, 1967; Hickson, Hinings, Schneck, & Pennings, 1971; Wofford, 1971; Pfeffer, 1981; Tushman & Romanelli, 1983; Astley & Sachdeva, 1984; Burkhardt & Brass, 1990; Bolino, 1999; Yli-Renko, Autio, & Sapienza, 2001; Subramanian & Soh, 2009.
<b>CTR3</b>	When I contribute my knowledge to a KMS, I will gain greater access to people, information, and other resources.	Kelley, 1967; Hickson, Hinings, Schneck, & Pennings, 1971; Wofford, 1971; Pfeffer, 1981; Tushman & Romanelli, 1983; Astley & Sachdeva, 1984; Burkhardt & Brass, 1990; Bolino, 1999; Yli-Renko, Autio, &

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Sapienza, 2001; Subramanian & Soh, 2009.

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**Section 5. Inducement as a factor for Contributing Knowledge to Knowledge Management System (KMS) (Construct: IND).**

<b>Item</b>	<b>Operational Declaration: As measured by the Intel Analyst's readiness (willingness – a motive or consideration that leads one to action) to contribute knowledge to a KMS.</b>	<b>Operational Reference from Literature Supporting Survey Instrument Item</b>
<b>IND1</b>	I will share my knowledge with other Intel Analysts by contributing to a KMS.	Bachrach & Baratz, 1962; Kelley, 1967; Hickson, Hinings, Schneck, & Pennings, 1971; Mulder, 1971; Wofford, 1971; Pfeffer, 1981; Tushman & Romanelli, 1983; Astley & Sachdeva, 1984; Burkhardt & Brass, 1990; MacInnis, Moorman, & Jaworski, 1991; Bolino, 1999; Hansen, Nohria, & Tierney, 1999; Gupta & Govindarajan, 2000; Wasko & Faraj, 2000; Ba, Stallaert, & Whinston, 2001; H. Hall, 2001; Yli-Renko, Autio, & Sapienza, 2001; Husted & Machilova, 2002; Ferrin & Dirks, 2003; Liebowitz, 2003; Bock, Zmud, Kim, & Lee, 2005; Kankanhalli, Tan, & Wei, 2005; Cabrera, Collins, & Salgado, 2006; Kim & Lee, 2006; Taylor, 2006; Kulkarni, Ravindran, & Freeze, 2007; Yao, Kam, & Chau, 2007; Liao, 2008; Renzl, 2008; Subramanian & Soh, 2009; Fehr, Holger, & Wilkening, 2013.
<b>IND2</b>	I will contribute my knowledge to a KMS, because I can help another Intel Analyst solve job-related problems, improve work effectiveness and productivity, or make a difference to the organization.	Bachrach & Baratz, 1962; Kelley, 1967; Hickson, Hinings, Schneck, & Pennings, 1971; Mulder, 1971; Wofford, 1971; Pfeffer, 1981; Tushman & Romanelli, 1983; Astley & Sachdeva, 1984; Burkhardt & Brass, 1990; MacInnis, Moorman, & Jaworski, 1991; Bolino, 1999; Hansen,

Nohria, & Tierney, 1999; Gupta & Govindarajan, 2000; Wasko & Faraj, 2000; Ba, Stallaert, & Whinston, 2001; H. Hall, 2001; Yli-Renko, Autio, & Sapienza, 2001; Husted & Machilova, 2002; Ferrin & Dirks, 2003; Liebowitz, 2003; Bock, Zmud, Kim, & Lee, 2005; Kankanhalli, Tan, & Wei, 2005; Cabrera, Collins, & Salgado, 2006; Kim & Lee, 2006; Taylor, 2006; Kulkarni, Ravindran, & Freeze, 2007; Yao, Kam, & Chau, 2007; Liao, 2008; Renzl, 2008; Subramanian & Soh, 2009; Fehr, Holger, & Wilkening, 2013.

**Section 6. Trust as a factor for contributing knowledge to a Knowledge Management System (KMS) (Construct: TR).**

<b>Item</b>	<b>Operational Declaration: The probability that another Intel Analyst will not perform an action that is beneficial (or at least not detrimental) to another.</b>	<b>Operational Reference from Literature Supporting Survey Instrument Item</b>
<b>TR1</b>	I believe Intel Analysts in my organization give credit for another Intel Analyst's knowledge where it is due.	Kee & Knox, 1970; Zand, 1972; Worchel, 1979; Rotter, 1980; Barber, 1983; Lewis & Weigert, 1985; Baier, 1986; Koller, 1988; Herbig, Milewicz, & Golden, 1994; Hosmer, 1995; Mayer, Davis, & Schooman, 1995; Noteboom, Berger, & Noorderhaven, 1997; Tyler & Kramer, 1995; Smeltzer, 1997; Doney, Cannon, & Mullen, 1998; Gambetta, 1998; Jones & George, 1998; Lewicki, McAllister, & Bies, 1998; Athanassiou & Nigh, 2000; Scott, 2000; Clarke & Rollo, 2001; Das & Teng, 2001; Knights, Noble, Vurdubakis, & Willmott, 2001; Olk & Elvira, 2001; Bartol & Srivastava, 2002; Bell, Oppenheimer, & Bastien, 2002; McEvily, Perrone, & Zaheer,

		2003; Das & Teng, 2004; Lucas, 2005; Mooradian, Renzl, & Martzler, 2006; Casalo, Flavian, & Guinaliu, 2007; Jøsang, Ismail, & Boyd, 2007; Søndergaard, Kerr, & Clegg, 2007; Renzl, 2008; Powley, 2009; Holste & Fields, 2010; Xu, Kim, & Kankanhalli, 2010; Powley & Nissen, 2012; Chen, Wu, & Chang, 2013.
<b>TR2</b>	I believe that Intel Analysts in my organization use other Intel Analyst's knowledge appropriately.	Kee & Knox, 1970; Zand, 1972; Worchel, 1979; Rotter, 1980; Barber, 1983; Lewis & Weigert, 1985; Baier, 1986; Koller, 1988; Herbig, Milewicz, & Golden, 1994; Hosmer, 1995; Mayer, Davis, & Schooman, 1995; Noteboom, Berger, & Noorderhaven, 1997; Tyler & Kramer, 1995; Smeltzer, 1997; Doney, Cannon, & Mullen, 1998; Gambetta, 1998; Jones & George, 1998; Lewicki, McAllister, & Bies, 1998; Athanassiou & Nigh, 2000; Scott, 2000; Clarke & Rollo, 2001; Das & Teng, 2001; Knights, Noble, Vurdubakis, & Willmott, 2001; Olk & Elvira, 2001; Bartol & Srivastava, 2002; Bell, Oppenheimer, & Bastien, 2002; McEvily, Perrone, & Zaheer, 2003; Das & Teng, 2004; Lucas, 2005; Mooradian, Renzl, & Martzler, 2006; Casalo, Flavian, & Guinaliu, 2007; Jøsang, Ismail, & Boyd, 2007; Søndergaard, Kerr, & Clegg, 2007; Renzl, 2008; Powley, 2009; Holste & Fields, 2010; Xu, Kim, & Kankanhalli, 2010; Powley & Nissen, 2012; Chen, Wu, & Chang, 2013.
<b>TR3</b>	I believe that Intel Analysts in my organization share the best knowledge that they have.	Kee & Knox, 1970; Zand, 1972; Worchel, 1979; Rotter, 1980; Barber, 1983; Lewis & Weigert, 1985; Baier, 1986; Koller, 1988; Herbig, Milewicz, & Golden,

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1994; Hosmer, 1995; Mayer, Davis, & Schooman, 1995; Noteboom, Berger, & Noorderhaven, 1997; Tyler & Kramer, 1995; Smeltzer, 1997; Doney, Cannon, & Mullen, 1998; Gambetta, 1998; Jones & George, 1998; Lewicki, McAllister, & Bies, 1998; Athanassiou & Nigh, 2000; Scott, 2000; Clarke & Rollo, 2001; Das & Teng, 2001; Knights, Noble, Vurdubakis, & Willmott, 2001; Olk & Elvira, 2001; Bartol & Srivastava, 2002; Bell, Oppenheimer, & Bastien, 2002; McEvily, Perrone, & Zaheer, 2003; Das & Teng, 2004; Lucas, 2005; Mooradian, Renzl, & Martzler, 2006; Casalo, Flavian, & Guinaliu, 2007; Jøsang, Ismail, & Boyd, 2007; Søndergaard, Kerr, & Clegg, 2007; Renzl, 2008; Powley, 2009; Holste & Fields, 2010; Xu, Kim, & Kankanhalli, 2010; Powley & Nissen, 2012; Chen, Wu, & Chang, 2013.

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**Section 7. Collaborative Environment as a factor for contributing knowledge to a Knowledge Management Systems (KMS) (Construct: CE).**

<b>Item</b>	<b>Operational Declaration: The use of information technologies specially designed to support human interaction and teamwork.</b>	<b>Operational Reference from Literature Supporting Survey Instrument Item</b>
<b>CE1</b>	When I contribute my knowledge to a KMS for the purpose of helping another Intel Analyst, I expect nothing in return.	Kraemer & Pinsonneault, 1990; Weick & Roberts, 1993; Ring & Van de Ven, 1994; Sambamurthy & Chin, 1994; Melin & Persson, 1996; Larsson, Bengtsson, Henriksson, & Sparks, 1998; Mudambi & Helper, 1998; Marjanovic, 1999; Rice & Gattiker, 1999; Amabile, Patterson, Mueller, Wojcik, Odomirock & Walsh, 2001; Wasko & Faraj, 2000; Li,

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		Karakowsky, & Lam, 2002; Maull, Tranfield, & Maull, 2003; Zolin % Hinds, 2004; Ojha, 2005; Sonnenwald, 2007; Abdolvand, Albadvi, & Ferdowsi, 2008; Van den Hooff, Schouten, & Simonovski, 2012.
<b>CE2</b>	When I contribute my knowledge to a KMS for the purpose of helping another Intel Analyst, I expect reciprocity (something in return) should the need arise.	Kraemer & Pinsonneault, 1990; Weick & Roberts, 1993; Ring & Van de Ven, 1994; Sambamurthy & Chin, 1994; Melin & Persson, 1996; Larsson, Bengtsson, Henriksson, & Sparks, 1998; Mudambi & Helper, 1998; Marjanovic, 1999; Rice & Gattiker, 1999; Amabile, Patterson, Mueller, Wojcik, Odomirock & Walsh, 2001; Wasko & Faraj, 2000; Li, Karakowsky, & Lam, 2002; Maull, Tranfield, & Maull, 2003; Zolin % Hinds, 2004; Ojha, 2005; Sonnenwald, 2007; Abdolvand, Albadvi, & Ferdowsi, 2008; Van den Hooff, Schouten, & Simonovski, 2012.

**Section 8. Resistance to (Knowledge) Sharing as a factor to contributing knowledge to a Knowledge Management System (KMS) (Construct RKS).**

<b>Item</b>	<b>Operational Declaration: The competitive individualism, effort, and ability that does <u>NOT</u> support cooperation and the sharing of expertise.</b>	<b>Operational Reference from Literature Supporting Survey Instrument Item</b>
<b>RKS1</b>	I do not contribute my knowledge to a KMS because I believe I will open myself to criticism or ridicule.	Zand, 1972; Dweck & Leggett, 1988; Szulanski, 1996; Chow, Harrison, McKinnon, & Wu, 1999; Chow, Deng, & Ho, 2000; Husted & Machilova, 2002; Ford & Chan, 2003; Oldham, 2003; Sawng, Kim, & Han, 2003; Thomas-Hunt, Ogden, & Neale, 2003; Cummings, 2004; Phillips, Mannix, Neale, & Gruenfeld, 2004; Ojha, 2005.

<b>RKS2</b>	I do not contribute my knowledge to a KMS because I believe I have not “earned the right” to do so.	Zand, 1972; Dweck & Leggett, 1988; Szulanski, 1996; Chow, Harrison, McKinnon, & Wu, 1999; Chow, Deng, & Ho, 2000; Husted & Machilova, 2002; Ford & Chan, 2003; Oldham, 2003; Sawng, Kim, & Han, 2003; Thomas-Hunt, Ogden, & Neale, 2003; Cummings, 2004; Phillips, Mannix, Neale, & Gruenfeld, 2004; Ojha, 2005.
<b>RKS3</b>	I do not contribute my knowledge to a KMS because most information requests from other Intel Analysts are not clear as to what information is requested/required.	Zand, 1972; Dweck & Leggett, 1988; Szulanski, 1996; Chow, Harrison, McKinnon, & Wu, 1999; Chow, Deng, & Ho, 2000; Husted & Machilova, 2002; Ford & Chan, 2003; Oldham, 2003; Sawng, Kim, & Han, 2003; Thomas-Hunt, Ogden, & Neale, 2003; Cummings, 2004; Phillips, Mannix, Neale, & Gruenfeld, 2004; Ojha, 2005.
<b>RKS4</b>	I do not contribute my knowledge to a KMS because my contributions require a time-consuming “manager review”.	Zand, 1972; Dweck & Leggett, 1988; Szulanski, 1996; Chow, Harrison, McKinnon, & Wu, 1999; Chow, Deng, & Ho, 2000; Husted & Machilova, 2002; Ford & Chan, 2003; Oldham, 2003; Sawng, Kim, & Han, 2003; Thomas-Hunt, Ogden, & Neale, 2003; Cummings, 2004; Phillips, Mannix, Neale, & Gruenfeld, 2004; Ojha, 2005.
<b>RKS5</b>	I do not contribute my knowledge to a KMS because of confidentiality/security concerns.	Zand, 1972; Dweck & Leggett, 1988; Szulanski, 1996; Chow, Harrison, McKinnon, & Wu, 1999; Chow, Deng, & Ho, 2000; Husted & Machilova, 2002; Ford & Chan, 2003; Oldham, 2003; Sawng, Kim, & Han, 2003; Thomas-Hunt, Ogden, & Neale, 2003; Cummings, 2004; Phillips, Mannix, Neale, & Gruenfeld, 2004; Ojha, 2005.
<b>RKS6</b>	I do not contribute my knowledge to a KMS because if I make a mistake I	Zand, 1972; Dweck & Leggett, 1988; Szulanski, 1996; Chow,



	will be punished.	Harrison, McKinnon, & Wu, 1999; Chow, Deng, & Ho, 2000; Husted & Machilova, 2002; Ford & Chan, 2003; Oldham, 2003; Sawng, Kim, & Han, 2003; Thomas-Hunt, Ogden, & Neale, 2003; Cummings, 2004; Phillips, Mannix, Neale, & Gruenfeld, 2004; Ojha, 2005.
<b>RKS7</b>	Most other Intel Analysts can contribute more valuable knowledge to a KMS than I can.	Zand, 1972; Dweck & Leggett, 1988; Szulanski, 1996; Chow, Harrison, McKinnon, & Wu, 1999; Chow, Deng, & Ho, 2000; Husted & Machilova, 2002; Ford & Chan, 2003; Oldham, 2003; Sawng, Kim, & Han, 2003; Thomas-Hunt, Ogden, & Neale, 2003; Cummings, 2004; Phillips, Mannix, Neale, & Gruenfeld, 2004; Ojha, 2005.

**Section 9. Willingness as a factor for contributing knowledge to a Knowledge Management System (KMS) (Construct: WIL).**

<b>Item</b>	<b>Operational Declaration: Doing something (or willing to do something) without being persuaded; inclined or favorably disposed in mind – ready, willing, and able to help.</b>	<b>Operational Reference from Literature Supporting Survey Instrument Item</b>
<b>WIL1</b>	I would allow another Intel Analyst to spend significant time observing and collaborating with me, through a KMS, in order for him/her to better understand and learn from my work.	Kee & Knox, 1970; Zand, 1972; Worchel, 1979; Rotter, 1980; Barber, 1983; Lewis & Weigert, 1985; Dweck & Leggett, 1988; Koller, 1988; Kraemer & Pinsonneault, 1990; Herbig, Milewicz, & Golden, 1994; Sambamurthy & Chin, 1994; Hosmer, 1995; Mayer, Davis, & Schooman, 1995; Tyler & Kramer, 1995; Melin & Persson, 1996; Szulanski, 1996; Smeltzer, 1997; Doney, Cannon, & Mullen, 1998; Gambetta, 1998; Jones & George, 1998; Chow, Harrison, McKinnon, & Wu, 1999; Rice & Gattiker,

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	<p>1999; Athanassiou &amp; Nigh, 2000; Chow, Deng, &amp; Ho, 2000; Scott, 2000; Wasko &amp; Faraj, 2000; Amabile, Patterson, Mueller, Wojcik, Odomirock &amp; Walsh, 2001; Clarke &amp; Rollo, 2001; Das &amp; Teng, 2001; Bartol &amp; Srivastava, 2002; Husted &amp; Machilova, 2002; Ford &amp; Chan, 2003; Maull, Tranfield, &amp; Maull, 2003; Oldham, 2003; Sawng, Kim, &amp; Han, 2003; Thomas-Hunt, Ogden, &amp; Neale, 2003; Cummings, 2004; Das &amp; Teng, 2004; Phillips, Mannix, Neale, &amp; Gruenfeld, 2004; Lucas, 2005; Ojha, 2005; Mooradian, Renzl, &amp; Martzler, 2006; Casalo, Flavian, &amp; Guinaliu, 2007; Jøsang, Ismail, &amp; Boyd, 2007; Søndergaard, Kerr, &amp; Clegg, 2007; Sonnenwald, 2007; Abdolvand, Albadvi, &amp; Ferdowsi, 2008; Renzl, 2008; Xu, Kim, &amp; Kankanhalli, 2010; van den Hooff, Schouten, &amp; Simonovski, 2012.</p>
<p><b>WIL2</b> I would willingly share with another Intel Analyst, through a KMS, what I have learned in terms of rules of thumb, tricks of the trade, and other insights into the work of my organization.</p>	<p>Kee &amp; Knox, 1970; Zand, 1972; Worchel, 1979; Rotter, 1980; Barber, 1983; Lewis &amp; Weigert, 1985; Dweck &amp; Leggett, 1988; Koller, 1988; Kraemer &amp; Pinsonneault, 1990; Herbig, Milewicz, &amp; Golden, 1994; Sambamurthy &amp; Chin, 1994; Hosmer, 1995; Mayer, Davis, &amp; Schooman, 1995; Tyler &amp; Kramer, 1995; Melin &amp; Persson, 1996; Szulanski, 1996; Smeltzer, 1997; Doney, Cannon, &amp; Mullen, 1998; Gambetta, 1998; Jones &amp; George, 1998; Chow, Harrison, McKinnon, &amp; Wu, 1999; Rice &amp; Gattiker, 1999; Athanassiou &amp; Nigh, 2000; Chow, Deng, &amp; Ho, 2000; Scott, 2000; Wasko &amp; Faraj, 2000; Amabile, Patterson, Mueller, Wojcik, Odomirock &amp; Walsh,</p>

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<b>WIL3</b>	I would willingly share my new ideas with another Intel Analyst through a KMS.	<p>2001; Clarke &amp; Rollo, 2001; Das &amp; Teng, 2001; Bartol &amp; Srivastava, 2002; Husted &amp; Machilova, 2002; Ford &amp; Chan, 2003; Maull, Tranfield, &amp; Maull, 2003; Oldham, 2003; Sawng, Kim, &amp; Han, 2003; Thomas-Hunt, Ogden, &amp; Neale, 2003; Cummings, 2004; Das &amp; Teng, 2004; Phillips, Mannix, Neale, &amp; Gruenfeld, 2004; Lucas, 2005; Ojha, 2005; Mooradian, Renzl, &amp; Martzler, 2006; Casalo, Flavian, &amp; Guinaliu, 2007; Jøsang, Ismail, &amp; Boyd, 2007; Søndergaard, Kerr, &amp; Clegg, 2007; Sonnenwald, 2007; Abdolvand, Albadvi, &amp; Ferdowski, 2008; Renzl, 2008; Xu, Kim, &amp; Kankanhalli, 2010; van den Hooff, Schouten, &amp; Simonovski, 2012.</p> <p>Kee &amp; Knox, 1970; Zand, 1972; Worchel, 1979; Rotter, 1980; Barber, 1983; Lewis &amp; Weigert, 1985; Dweck &amp; Leggett, 1988; Koller, 1988; Kraemer &amp; Pinsonneault, 1990; Herbig, Milewicz, &amp; Golden, 1994; Sambamurthy &amp; Chin, 1994; Hosmer, 1995; Mayer, Davis, &amp; Schooman, 1995; Tyler &amp; Kramer, 1995; Melin &amp; Persson, 1996; Szulanski, 1996; Smeltzer, 1997; Doney, Cannon, &amp; Mullen, 1998; Gambetta, 1998; Jones &amp; George, 1998; Chow, Harrison, McKinnon, &amp; Wu, 1999; Rice &amp; Gattiker, 1999; Athanassiou &amp; Nigh, 2000; Chow, Deng, &amp; Ho, 2000; Scott, 2000; Wasko &amp; Faraj, 2000; Amabile, Patterson, Mueller, Wojcik, Odomirock &amp; Walsh, 2001; Clarke &amp; Rollo, 2001; Das &amp; Teng, 2001; Bartol &amp; Srivastava, 2002; Husted &amp; Machilova, 2002; Ford &amp; Chan, 2003; Maull, Tranfield, &amp; Maull,</p>
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	<p>2003; Oldham, 2003; Sawng, Kim, &amp; Han, 2003; Thomas-Hunt, Ogden, &amp; Neale, 2003; Cummings, 2004; Das &amp; Teng, 2004; Phillips, Mannix, Neale, &amp; Gruenfeld, 2004; Lucas, 2005; Ojha, 2005; Mooradian, Renzl, &amp; Martzler, 2006; Casalo, Flavian, &amp; Guinaliu, 2007; Jøsang, Ismail, &amp; Boyd, 2007; Søndergaard, Kerr, &amp; Clegg, 2007; Sonnenwald, 2007; Abdolvand, Albadvi, &amp; Ferdowski, 2008; Renzl, 2008; Xu, Kim, &amp; Kankanhalli, 2010; van den Hooff, Schouten, &amp; Simonovski, 2012.</p>
<p><b>WIL4</b> If relevant to my work, I would welcome the opportunity to spend significant time with another Intel Analyst observing and collaborating with this individual, through a KMS, in order for me to better understand and learn from his/her work.</p>	<p>Kee &amp; Knox, 1970; Zand, 1972; Worchel, 1979; Rotter, 1980; Barber, 1983; Lewis &amp; Weigert, 1985; Dweck &amp; Leggett, 1988; Koller, 1988; Kraemer &amp; Pinsonneault, 1990; Herbig, Milewicz, &amp; Golden, 1994; Sambamurthy &amp; Chin, 1994; Hosmer, 1995; Mayer, Davis, &amp; Schooman, 1995; Tyler &amp; Kramer, 1995; Melin &amp; Persson, 1996; Szulanski, 1996; Smeltzer, 1997; Doney, Cannon, &amp; Mullen, 1998; Gambetta, 1998; Jones &amp; George, 1998; Chow, Harrison, McKinnon, &amp; Wu, 1999; Rice &amp; Gattiker, 1999; Athanassiou &amp; Nigh, 2000; Chow, Deng, &amp; Ho, 2000; Scott, 2000; Wasko &amp; Faraj, 2000; Amabile, Patterson, Mueller, Wojcik, Odomirock &amp; Walsh, 2001; Clarke &amp; Rollo, 2001; Das &amp; Teng, 2001; Bartol &amp; Srivastava, 2002; Husted &amp; Machilova, 2002; Ford &amp; Chan, 2003; Maull, Tranfield, &amp; Maull, 2003; Oldham, 2003; Sawng, Kim, &amp; Han, 2003; Thomas-Hunt, Ogden, &amp; Neale, 2003; Cummings, 2004; Das &amp; Teng, 2004; Phillips, Mannix, Neale, &amp;</p>

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<b>WIL5</b>	I would welcome and use, through a KMS, any rules of thumb, tricks of the trade, and other insights another Intel Analyst has learned.	<p>Gruenfeld, 2004; Lucas, 2005; Ojha, 2005; Mooradian, Renzl, &amp; Martzler, 2006; Casalo, Flavian, &amp; Guinaliu, 2007; Jøsang, Ismail, &amp; Boyd, 2007; Søndergaard, Kerr, &amp; Clegg, 2007; Sonnenwald, 2007; Abdolvand, Albadvi, &amp; Ferdowsi, 2008; Renzl, 2008; Xu, Kim, &amp; Kankanhalli, 2010; van den Hooff, Schouten, &amp; Simonovski, 2012.</p> <p>Kee &amp; Knox, 1970; Zand, 1972; Worchel, 1979; Rotter, 1980; Barber, 1983; Lewis &amp; Weigert, 1985; Dweck &amp; Leggett, 1988; Koller, 1988; Kraemer &amp; Pinsonneault, 1990; Herbig, Milewicz, &amp; Golden, 1994; Sambamurthy &amp; Chin, 1994; Hosmer, 1995; Mayer, Davis, &amp; Schooman, 1995; Tyler &amp; Kramer, 1995; Melin &amp; Persson, 1996; Szulanski, 1996; Smeltzer, 1997; Doney, Cannon, &amp; Mullen, 1998; Gambetta, 1998; Jones &amp; George, 1998; Chow, Harrison, McKinnon, &amp; Wu, 1999; Rice &amp; Gattiker, 1999; Athanassiou &amp; Nigh, 2000; Chow, Deng, &amp; Ho, 2000; Scott, 2000; Wasko &amp; Faraj, 2000; Amabile, Patterson, Mueller, Wojcik, Odomirock &amp; Walsh, 2001; Clarke &amp; Rollo, 2001; Das &amp; Teng, 2001; Bartol &amp; Srivastava, 2002; Husted &amp; Machilova, 2002; Ford &amp; Chan, 2003; Maull, Tranfield, &amp; Maull, 2003; Oldham, 2003; Sawng, Kim, &amp; Han, 2003; Thomas-Hunt, Ogden, &amp; Neale, 2003; Cummings, 2004; Das &amp; Teng, 2004; Phillips, Mannix, Neale, &amp; Gruenfeld, 2004; Lucas, 2005; Ojha, 2005; Mooradian, Renzl, &amp; Martzler, 2006; Casalo, Flavian, &amp; Guinaliu, 2007; Jøsang, Ismail, &amp; Boyd, 2007; Søndergaard, Kerr, &amp;</p>
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Clegg, 2007; Sonnenwald, 2007; Abdolvand, Albadvi, & Ferdowsi, 2008; Renzl, 2008; Xu, Kim, & Kankanhalli, 2010; van den Hooff, Schouten, & Simonovski, 2012.

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**Section 10. Ease of Use as a factor for contributing knowledge to a Knowledge Management System (KMS) (Construct: EOU).**

<b>Item</b>	<b>Operational Declaration: Degree to which the User perceives the use of KMS to be intuitive or free of effort (Self-efficacy/Computer Self-efficacy); without the benefit of advanced explanation and/or instruction manual.</b>	<b>Operational Reference from Literature Supporting Survey Instrument Item</b>
<b>EOU1</b>	The KMS used for contributing my knowledge is easy to learn.	Fishbein & Ajzen, 1975; Lucas, 1975; Robey, 1979; Bagozzi, 1981; Lucas, 1981; Bagozzi, 1982; Swanson, 1982; Bandura, 1986; Cheney, Mann, & Amoroso, 1986; Goodhue, 1986; Gist, 1987; Swanson, 1987; Davis, 1989; Davis, Bagozzi, & Warsaw, 1989; Pentland, 1989; Doll & Torkzadeh, 1991; Moore & Benbasat, 1991; Thompson, Higgins, & Howell, 1991; DeLone & McLean, 1992; Gist & Mitchell, 1992; Hartwick & Barki, 1994; Triandis, 1994; Compeau & Higgins, 1995; Goodhue & Thompson, 1995; Igarria & Iivari, 1995; Marakas, Yi, & Johnson, 1998; Higgins & Huff, 1999; Agarwahl & Karahanna, 2000; Alavi & Leidner, 2001; Adams & Lamont, 2003; Havelka, 2003; Legris, Ingham, & Collette, 2003; Ndubisi & Jantan, 2003; Venkatesh, 2003; Gong, Xu, & Yu, 2004; Hasan & Ali, 2004; Hsu & Chiu, 2004; Money & Turner, 2005; Endres, Endres, Chowdbury, & Alam, 2007; Lien, Hung, & McLean, 2007; Schaper & Pervan,

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<b>EOU2</b>	The KMS used for contributing knowledge is easy to use.	<p>2007; Levy &amp; Green, 2009.</p> <p>Fishbein &amp; Ajzen, 1975; Lucas, 1975; Robey, 1979; Bagozzi, 1981; Lucas, 1981; Bagozzi, 1982; Swanson, 1982; Bandura, 1986; Cheney, Mann, &amp; Amoroso, 1986; Goodhue, 1986; Gist, 1987; Swanson, 1987; Davis, 1989; Davis, Bagozzi, &amp; Warsaw, 1989; Pentland, 1989; Doll &amp; Torkzadeh, 1991; Moore &amp; Benbasat, 1991; Thompson, Higgins, &amp; Howell, 1991; DeLone &amp; McLean, 1992; Gist &amp; Mitchell, 1992; Hartwick &amp; Barki, 1994; Triandis, 1994; Compeau &amp; Higgins, 1995; Goodhue &amp; Thompson, 1995; Igarria &amp; Iivari, 1995; Marakas, Yi, &amp; Johnson, 1998; Higgins &amp; Huff, 1999; Agarwahl &amp; Karahanna, 2000; Alavi &amp; Leidner, 2001; Adams &amp; Lamont, 2003; Havelka, 2003; Legris, Ingham, &amp; Colletette, 2003; Ndubisi &amp; Jantan, 2003; Venkatesh, 2003; Gong, Xu, &amp; Yu, 2004; Hasan &amp; Ali, 2004; Hsu &amp; Chiu, 2004; Money &amp; Turner, 2005; Endres, Endres, Chowdbury, &amp; Alam, 2007; Lien, Hung, &amp; McLean, 2007; Schaper &amp; Pervan, 2007; Levy &amp; Green, 2009.</p>
<b>EOU3</b>	The KMS procedures for contributing my knowledge are clear and understandable.	<p>Fishbein &amp; Ajzen, 1975; Lucas, 1975; Robey, 1979; Bagozzi, 1981; Lucas, 1981; Bagozzi, 1982; Swanson, 1982; Bandura, 1986; Cheney, Mann, &amp; Amoroso, 1986; Goodhue, 1986; Gist, 1987; Swanson, 1987; Davis, 1989; Davis, Bagozzi, &amp; Warsaw, 1989; Pentland, 1989; Doll &amp; Torkzadeh, 1991; Moore &amp; Benbasat, 1991; Thompson, Higgins, &amp; Howell, 1991; DeLone &amp; McLean, 1992; Gist &amp; Mitchell, 1992; Hartwick &amp; Barki, 1994;</p>

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Triandis, 1994; Compeau & Higgins, 1995; Goodhue & Thompson, 1995; Igarria & Iivari, 1995; Marakas, Yi, & Johnson, 1998; Higgins & Huff, 1999; Agarwahl & Karahanna, 2000; Alavi & Leidner, 2001; Adams & Lamont, 2003; Havelka, 2003; Legris, Ingham, & Colletette, 2003; Ndubisi & Jantan, 2003; Venkatesh, 2003; Gong, Xu, & Yu, 2004; Hasan & Ali, 2004; Hsu & Chiu, 2004; Money & Turner, 2005; Endres, Endres, Chowdbury, & Alam, 2007; Lien, Hung, & McLean, 2007; Schaper & Pervan, 2007; Levy & Green, 2009.

**Section 11. Organization Structure as a factor for contributing knowledge to a Knowledge Management System (KMS) (Construct: OS).**

<b>Item</b>	<b>Operational Declaration: The rules, procedures, policies, and hierarchy of reporting relationships that supports the Intel Analyst's contribution to a KMS towards the achievement of organizational goals.</b>	<b>Operational Reference from Literature Supporting Survey Instrument Item</b>
OS1	My organization encourages interaction among employees for the purpose of knowledge sharing.	Gouldner, 1960; Etzioni, 1961; Levinson, 1965; Hage, Aiken, & Marrett, 1971; Steers, 1977; Gould, 1979; Mowday, Porter, & Steers, 1982; Bateman & Organ, 1983; Astley & Sachdeva, 1984; Brief & Motowidlo, 1986; Eisenberg et al., 1986; Organ & Konovsky, 1989; Mathieu & Zajac, 1990; March & Simon, 1993; Dutton, Dukerich, & Harquail, 1994; Rousseau, 1995; Shore & Shore, 1995; Meyer & Allen, 1997; Tsui et al., 1997; Shore & Barksdale, 1998; Eisenberger et al., 2001; Gold et al., 2001; Rhoades, Eisenberger, & Armeli, 2001; Crowe et al., 2002;



		Bartol et al., 2009.
<b>OS2</b>	My organization values ideas for their merit rather than the source.	Gouldner, 1960; Etzioni, 1961; Levinson, 1965; Hage, Aiken, & Marrett, 1971; Steers, 1977; Gould, 1979; Mowday, Porter, & Steers, 1982; Bateman & Organ, 1983; Astley & Sachdeva, 1984; Brief & Motowidlo, 1986; Eisenberg et al., 1986; Organ & Konovsky, 1989; Mathieu & Zajac, 1990; March & Simon, 1993; Dutton, Dukerich, & Harquail, 1994; Rousseau, 1995; Shore & Shore, 1995; Meyer & Allen, 1997; Tsui et al., 1997; Shore & Barksdale, 1998; Eisenberger et al., 2001; Gold et al., 2001; Rhoades, Eisenberger, & Armeli, 2001; Crowe et al., 2002; Bartol et al., 2009.
<b>OS3</b>	My organization promotes collective rather than individualistic behavior.	Gouldner, 1960; Etzioni, 1961; Levinson, 1965; Hage, Aiken, & Marrett, 1971; Steers, 1977; Gould, 1979; Mowday, Porter, & Steers, 1982; Bateman & Organ, 1983; Astley & Sachdeva, 1984; Brief & Motowidlo, 1986; Eisenberg et al., 1986; Organ & Konovsky, 1989; Mathieu & Zajac, 1990; March & Simon, 1993; Dutton, Dukerich, & Harquail, 1994; Rousseau, 1995; Shore & Shore, 1995; Meyer & Allen, 1997; Tsui et al., 1997; Shore & Barksdale, 1998; Eisenberger et al., 2001; Gold et al., 2001; Rhoades, Eisenberger, & Armeli, 2001; Crowe et al., 2002; Bartol et al., 2009.
<b>OS4</b>	My organization is open to conflicting views in the sharing of knowledge.	Gouldner, 1960; Etzioni, 1961; Levinson, 1965; Hage, Aiken, & Marrett, 1971; Steers, 1977; Gould, 1979; Mowday, Porter, & Steers, 1982; Bateman & Organ, 1983; Astley & Sachdeva, 1984; Brief & Motowidlo, 1986;

Eisenberg et al., 1986; Organ & Konovsky, 1989; Mathieu & Zajac, 1990; March & Simon, 1993; Dutton, Dukerich, & Harquail, 1994; Rousseau, 1995; Shore & Shore, 1995; Meyer & Allen, 1997; Tsui et al., 1997; Shore & Barksdale, 1998; Eisenberger et al., 2001; Gold et al., 2001; Rhoades, Eisenberger, & Armeli, 2001; Crowe et al., 2002; Bartol et al., 2009.

**Section 12. Top Management Support as a factor for contributing knowledge to a Knowledge Management System (KMS) (Construct: TMS).**

<b>Item</b>	<b>Operational Declaration: The Intel Analyst's perception of Senior Leadership/Management support in the contribution of knowledge to a KMS.</b>	<b>Operational Reference from Literature Supporting Survey Instrument Item</b>
<b>TMS1</b>	Senior management promotes and supports knowledge sharing and collaboration through KMS.	Eisenhardt, 1989; Crowe, Fong, Bauman, & Zayas-Castro, 2002; Connelly & Kelloway, 2003; Lewis, Agarwahl, & Sambamurthy, 2003; Cabrera, Collins, & Salgado, 2006; Kulkarni, Ravindran, & Freeze, 2007; Lee, Kim, & Kim, 2006; Lin, 2007b; King & Marks, 2008; Liao, 2008.
<b>TMS2</b>	Senior management allocates requisite resources facilitating knowledge sharing and collaboration through KMS.	Eisenhardt, 1989; Crowe, Fong, Bauman, & Zayas-Castro, 2002; Connelly & Kelloway, 2003; Lewis, Agarwahl, & Sambamurthy, 2003; Cabrera, Collins, & Salgado, 2006; Kulkarni, Ravindran, & Freeze, 2007; Lee, Kim, & Kim, 2006; Lin, 2007b; King & Marks, 2008; Liao, 2008.
<b>TMS3</b>	Senior management has a norm of tolerance for mistakes made in knowledge sharing and collaboration through KMS.	Eisenhardt, 1989; Crowe, Fong, Bauman, & Zayas-Castro, 2002; Connelly & Kelloway, 2003; Lewis, Agarwahl, & Sambamurthy, 2003; Cabrera,

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Collins, & Salgado, 2006;  
Kulkarni, Ravindran, & Freeze,  
2007; Lee, Kim, & Kim, 2006;  
Lin, 2007b; King & Marks, 2008;  
Liao, 2008.

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**Section 13. Opportunity as a factor for contributing knowledge to a Knowledge Management System (KMS) (Construct: OPP).**

<b>Item</b>	<b>Operational Declaration: Perception the Intel Analyst was given the chance to contribute knowledge or, was constrained by any aspect of the organization.</b>	<b>Operational Reference from Literature Supporting Survey Instrument Item</b>
<b>OPP1</b>	My organization does not place any restraints or constraints on me with respect to knowledge sharing and/or collaboration using a KMS.	Gouldner, 1960; Etzioni, 1961; Levinson, 1965; Fishbein & Ajzen, 1975; Lucas, 1975; Steers, 1977; Gould, 1979; Robey, 1979; Bagozzi, 1981; Lucas, 1981; Bagozzi, 1982; Mowday, Porter, & Steers, 1982; Swanson, 1982; Bateman & Organ, 1983; Astley & Sachdeva, 1984; Bandura, 1986; Brief & Motowidlo, 1986; Cheney, Mann, & Amoroso, 1986; Eisenberg et al., 1986; Goodhue, 1986; Gist, 1987; Swanson, 1987; Davis, 1989; Davis, Bagozzi, & Warsaw, 1989; Eisenhardt, 1989; Organ & Konovsky, 1989; Pentland, 1989; Mathieu & Zajac, 1990; Doll & Torkzadeh, 1991; Moore & Benbasat, 1991; Thompson, Higgins, & Howell, 1991; DeLone & McLean, 1992; Gist & Mitchell, 1992; March & Simon, 1993; Hartwick & Barki, 1994; Triandis, 1994; Compeau & Higgins, 1995; Goodhue & Thompson, 1995; Igarria & Iivari, 1995; Rousseau, 1995; Shore & Shore, 1995; Meyer & Allen, 1997; Tsui et al., 1997; Marakas, Yi, & Johnson, 1998; Shore & Barksdale, 1998; Higgins & Huff,

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	<p>1999; Agarwahl &amp; Karahanna, 2000; Alavi &amp; Leidner, 2001; Eisenberger et al., 2001; Gold et al., 2001; Rhoades, Eisenberger, &amp; Armeli, 2001; Crowe et al., 2002; Adams &amp; Lamont, 2003; Connelly &amp; Kelloway, 2003; Havelka, 2003; Legris, Ingham, &amp; Collette, 2003; Lewis, Agarwahl, &amp; Sambamurthy, 2003; Ndubisi &amp; Jantan, 2003; Venkatesh, 2003; Gong, Xu, &amp; Yu, 2004; Hasan &amp; Ali, 2004; Hsu &amp; Chiu, 2004; Money &amp; Turner, 2005; Cabrera, Collins, &amp; Salgado, 2006; Lee, Kim, &amp; Kim, 2006; Kulkarni, Ravindran, &amp; Freeze, 2007; Lien, Hung, &amp; McLean, 2007; Lin, 2007b; King &amp; Marks, 2008; Liao, 2008; Bartol et al., 2009; Levy &amp; Green, 2009.</p>
<p><b>OPP2</b> My organization gives me sufficient opportunity to contribute my knowledge to a KMS.</p>	<p>Gouldner, 1960; Etzioni, 1961; Levinson, 1965; Fishbein &amp; Ajzen, 1975; Lucas, 1975; Steers, 1977; Gould, 1979; Robey, 1979; Bagozzi, 1981; Lucas, 1981; Bagozzi, 1982; Mowday, Porter, &amp; Steers, 1982; Swanson, 1982; Bateman &amp; Organ, 1983; Astley &amp; Sachdeva, 1984; Bandura, 1986; Brief &amp; Motowidlo, 1986; Cheney, Mann, &amp; Amoroso, 1986; Eisenberg et al., 1986; Goodhue, 1986; Gist, 1987; Swanson, 1987; Davis, 1989; Davis, Bagozzi, &amp; Warsaw, 1989; Eisenhardt, 1989; Organ &amp; Konovsky, 1989; Pentland, 1989; Mathieu &amp; Zajac, 1990; Doll &amp; Torkzadeh, 1991; Moore &amp; Benbasat, 1991; Thompson, Higgins, &amp; Howell, 1991; DeLone &amp; McLean, 1992; Gist &amp; Mitchell, 1992; March &amp; Simon, 1993; Hartwick &amp; Barki, 1994; Triandis, 1994; Compeau &amp; Higgins, 1995; Goodhue &amp;</p>

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	<p>Thompson, 1995; Igbaria &amp; Iivari, 1995; Rousseau, 1995; Shore &amp; Shore, 1995; Meyer &amp; Allen, 1997; Tsui et al., 1997; Marakas, Yi, &amp; Johnson, 1998; Shore &amp; Barksdale, 1998; Higgins &amp; Huff, 1999; Agarwahl &amp; Karahanna, 2000; Alavi &amp; Leidner, 2001; Eisenberger et al., 2001; Gold et al., 2001; Rhoades, Eisenberger, &amp; Armeli, 2001; Crowe et al., 2002; Adams &amp; Lamont, 2003; Connelly &amp; Kelloway, 2003; Havelka, 2003; Legris, Ingham, &amp; Collette, 2003; Lewis, Agarwahl, &amp; Sambamurthy, 2003; Ndubisi &amp; Jantan, 2003; Venkatesh, 2003; Gong, Xu, &amp; Yu, 2004; Hasan &amp; Ali, 2004; Hsu &amp; Chiu, 2004; Money &amp; Turner, 2005; Cabrera, Collins, &amp; Salgado, 2006; Lee, Kim, &amp; Kim, 2006; Kulkarni, Ravindran, &amp; Freeze, 2007; Lien, Hung, &amp; McLean, 2007; Lin, 2007b; King &amp; Marks, 2008; Liao, 2008; Bartol et al., 2009; Levy &amp; Green, 2009.</p>
<p><b>OPP3</b> My organization is helpful to me in contributing my knowledge to a KMS.</p>	<p>Gouldner, 1960; Etzioni, 1961; Levinson, 1965; Fishbein &amp; Ajzen, 1975; Lucas, 1975; Steers, 1977; Gould, 1979; Robey, 1979; Bagozzi, 1981; Lucas, 1981; Bagozzi, 1982; Mowday, Porter, &amp; Steers, 1982; Swanson, 1982; Bateman &amp; Organ, 1983; Astley &amp; Sachdeva, 1984; Bandura, 1986; Brief &amp; Motowidlo, 1986; Cheney, Mann, &amp; Amoroso, 1986; Eisenberg et al., 1986; Goodhue, 1986; Gist, 1987; Swanson, 1987; Davis, 1989; Davis, Bagozzi, &amp; Warsaw, 1989; Eisenhardt, 1989; Organ &amp; Konovsky, 1989; Pentland, 1989; Mathieu &amp; Zajac, 1990; Doll &amp; Torkzadeh, 1991; Moore &amp; Benbasat, 1991;</p>

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Thompson, Higgins, & Howell, 1991; DeLone & McLean, 1992; Gist & Mitchell, 1992; March & Simon, 1993; Hartwick & Barki, 1994; Triandis, 1994; Compeau & Higgins, 1995; Goodhue & Thompson, 1995; Igarria & Iivari, 1995; Rousseau, 1995; Shore & Shore, 1995; Meyer & Allen, 1997; Tsui et al., 1997; Marakas, Yi, & Johnson, 1998; Shore & Barksdale, 1998; Higgins & Huff, 1999; Agarwahl & Karahanna, 2000; Alavi & Leidner, 2001; Eisenberger et al., 2001; Gold et al., 2001; Rhoades, Eisenberger, & Armeli, 2001; Crowe et al., 2002; Adams & Lamont, 2003; Connelly & Kelloway, 2003; Havelka, 2003; Legris, Ingham, & Collette, 2003; Lewis, Agarwahl, & Sambamurthy, 2003; Ndubisi & Jantan, 2003; Venkatesh, 2003; Gong, Xu, & Yu, 2004; Hasan & Ali, 2004; Hsu & Chiu, 2004; Money & Turner, 2005; Cabrera, Collins, & Salgado, 2006; Lee, Kim, & Kim, 2006; Kulkarni, Ravindran, & Freeze, 2007; Lien, Hung, & McLean, 2007; Lin, 2007b; King & Marks, 2008; Liao, 2008; Bartol et al., 2009; Levy & Green, 2009.

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**Section 14. Individual Willingness Inducement of an Intel Analyst's willingness to contribute knowledge to a Knowledge Management System (KMS) (Construct: IWI).**

<b>Item</b>	<b>Operational Declaration: Inducement – a motive or consideration that moves one to action. Willingness – doing something or willing to do something without persuasion.</b>	<b>Operational Reference from Literature Supporting Survey Instrument Item</b>
<b>IWI1</b>	Inducements do not influence my	Bachrach & Baratz, 1962; Kelley,

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willingness to contribute my knowledge to a KMS in my work.	1967; Hickson, Hinings, Schneck, & Pennings, 1971; Mulder, 1971; Wofford, 1971; Pfeffer, 1981; Tushman & Romanelli, 1983; Astley & Sachdeva, 1984; Burkhardt & Brass, 1990; MacInnis, Moorman, & Jaworski, 1991; Bolino, 1999; Hansen, Nohria, & Tierney, 1999; Gupta & Govindarajan, 2000; Wasko & Faraj, 2000; Ba, Stallaert, & Whinston, 2001; H. Hall, 2001; Yli-Renko, Autio, & Sapienza, 2001; Husted & Machilova, 2002; Ferrin & Dirks, 2003; Liebowitz, 2003; Bock, Zmud, Kim, & Lee, 2005; Kankanhalli, Tan, & Wei, 2005; Cabrera, Collins, & Salgado, 2006; Kim & Lee, 2006; Taylor, 2006; Kulkarni, Ravindran, & Freeze, 2007; Yao, Kam, & Chau, 2007; Liao, 2008; Renzl, 2008; Subramanian & Soh, 2009; Fehr, Holger, & Wilkening, 2013
<b>IWI2</b> Inducements sometimes influence my willingness to contribute my knowledge to a KMS in my work.	Bachrach & Baratz, 1962; Kelley, 1967; Hickson, Hinings, Schneck, & Pennings, 1971; Mulder, 1971; Wofford, 1971; Pfeffer, 1981; Tushman & Romanelli, 1983; Astley & Sachdeva, 1984; Burkhardt & Brass, 1990; MacInnis, Moorman, & Jaworski, 1991; Bolino, 1999; Hansen, Nohria, & Tierney, 1999; Gupta & Govindarajan, 2000; Wasko & Faraj, 2000; Ba, Stallaert, & Whinston, 2001; H. Hall, 2001; Yli-Renko, Autio, & Sapienza, 2001; Husted & Machilova, 2002; Ferrin & Dirks, 2003; Liebowitz, 2003; Bock, Zmud, Kim, & Lee, 2005; Kankanhalli, Tan, & Wei, 2005; Cabrera, Collins, & Salgado, 2006; Kim & Lee, 2006; Taylor, 2006; Kulkarni, Ravindran, & Freeze, 2007; Yao, Kam, & Chau,

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		2007; Liao, 2008; Renzl, 2008; Subramanian & Soh, 2009; Fehr, Holger, & Wilkening, 2013
<b>IWI3</b>	Inducements frequently influence my willingness to contribute my knowledge to a KMS in my work.	Bachrach & Baratz, 1962; Kelley, 1967; Hickson, Hinings, Schneck, & Pennings, 1971; Mulder, 1971; Wofford, 1971; Pfeffer, 1981; Tushman & Romanelli, 1983; Astley & Sachdeva, 1984; Burkhardt & Brass, 1990; MacInnis, Moorman, & Jaworski, 1991; Bolino, 1999; Hansen, Nohria, & Tierney, 1999; Gupta & Govindarajan, 2000; Wasko & Faraj, 2000; Ba, Stallaert, & Whinston, 2001; H. Hall, 2001; Yli-Renko, Autio, & Sapienza, 2001; Husted & Machilova, 2002; Ferrin & Dirks, 2003; Liebowitz, 2003; Bock, Zmud, Kim, & Lee, 2005; Kankanhalli, Tan, & Wei, 2005; Cabrera, Collins, & Salgado, 2006; Kim & Lee, 2006; Taylor, 2006; Kulkarni, Ravindran, & Freeze, 2007; Yao, Kam, & Chau, 2007; Liao, 2008; Renzl, 2008; Subramanian & Soh, 2009; Fehr, Holger, & Wilkening, 2013
<b>IWI4</b>	Without Inducements I am not willing to contribute my knowledge to a KMS in my work.	Bachrach & Baratz, 1962; Kelley, 1967; Hickson, Hinings, Schneck, & Pennings, 1971; Mulder, 1971; Wofford, 1971; Pfeffer, 1981; Tushman & Romanelli, 1983; Astley & Sachdeva, 1984; Burkhardt & Brass, 1990; MacInnis, Moorman, & Jaworski, 1991; Bolino, 1999; Hansen, Nohria, & Tierney, 1999; Gupta & Govindarajan, 2000; Wasko & Faraj, 2000; Ba, Stallaert, & Whinston, 2001; H. Hall, 2001; Yli-Renko, Autio, & Sapienza, 2001; Husted & Machilova, 2002; Ferrin & Dirks, 2003; Liebowitz, 2003; Bock, Zmud, Kim, & Lee, 2005; Kankanhalli, Tan, & Wei,



2005; Cabrera, Collins, & Salgado, 2006; Kim & Lee, 2006; Taylor, 2006; Kulkarni, Ravindran, & Freeze, 2007; Yao, Kam, & Chau, 2007; Liao, 2008; Renzl, 2008; Subramanian & Soh, 2009; Fehr, Holger, & Wilkening, 2013

**Section 15. Individual Willingness Opportunity as a factor in an Intel Analyst's willingness to contribute knowledge to a Knowledge Management System (KMS) (Construct: IWO).**

<b>Item</b>	<b>Operational Declaration: Opportunity – perception that the Intel Analyst was given a chance to contribute knowledge. Willingness – doing something or willing to do something without persuasion.</b>	<b>Operational Reference from Literature Supporting Survey Instrument Item</b>
<b>IWO1</b>	Given the opportunity, I am frequently willing to use a KMS to contribute my knowledge in my work.	Gouldner, 1960; Etzioni, 1961; Levinson, 1965; Fishbein & Ajzen, 1975; Lucas, 1975; Steers, 1977; Gould, 1979; Robey, 1979; Bagozzi, 1981; Lucas, 1981; Bagozzi, 1982; Mowday, Porter, & Steers, 1982; Swanson, 1982; Bateman & Organ, 1983; Astley & Sachdeva, 1984; Bandura, 1986; Brief & Motowidlo, 1986; Cheney, Mann, & Amoroso, 1986; Eisenberg et al., 1986; Goodhue, 1986; Gist, 1987; Swanson, 1987; Davis, 1989; Davis, Bagozzi, & Warsaw, 1989; Eisenhardt, 1989; Organ & Konovsky, 1989; Pentland, 1989; Mathieu & Zajac, 1990; Doll & Torkzadeh, 1991; Moore & Benbasat, 1991; Thompson, Higgins, & Howell, 1991; DeLone & McLean, 1992; Gist & Mitchell, 1992; March & Simon, 1993; Hartwick & Barki, 1994; Triandis, 1994; Compeau & Higgins, 1995; Goodhue & Thompson, 1995; Igarria & Iivari, 1995; March & Simon, 1993; Rousseau, 1995; Shore & Shore,

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	<p>1995; Meyer &amp; Allen, 1997; Tsui et al., 1997; Marakas, Yi, &amp; Johnson, 1998; Shore &amp; Barksdale, 1998; Higgins &amp; Huff, 1999; Agarwahl &amp; Karahanna, 2000; Alavi &amp; Leidner, 2001; Eisenberger et al., 2001; Gold et al., 2001; Rhoades, Eisenberger, &amp; Armeli, 2001; Crowe et al., 2002; Adams &amp; Lamont, 2003; Connelly &amp; Kelloway, 2003; Havelka, 2003; Legris, Ingham, &amp; Collette, 2003; Lewis, Agarwahl, &amp; Sambamurthy, 2003; Ndubisi &amp; Jantan, 2003; Venkatesh, 2003; Gong, Xu, &amp; Yu, 2004; Hasan &amp; Ali, 2004; Hsu &amp; Chiu, 2004; Money &amp; Turner, 2005; Cabrera, Collins, &amp; Salgado, 2006; Lee, Kim, &amp; Kim, 2006; Kulkarni, Ravindran, &amp; Freeze, 2007; Lien, Hung, &amp; McLean, 2007; Lin, 2007b; King &amp; Marks, 2008; Lia, 2008; Bartol et al., 2009; Levy &amp; Green, 2009.</p>
<p><b>IWO2</b>      Given the opportunity, I am always willing to use a KMS to contribute my knowledge in my work.</p>	<p>Gouldner, 1960; Etzioni, 1961; Levinson, 1965; Fishbein &amp; Ajzen, 1975; Lucas, 1975; Steers, 1977; Gould, 1979; Robey, 1979; Bagozzi, 1981; Lucas, 1981; Bagozzi, 1982; Mowday, Porter, &amp; Steers, 1982; Swanson, 1982; Bateman &amp; Organ, 1983; Astley &amp; Sachdeva, 1984; Bandura, 1986; Brief &amp; Motowidlo, 1986; Cheney, Mann, &amp; Amoroso, 1986; Eisenberg et al., 1986; Goodhue, 1986; Gist, 1987; Swanson, 1987; Davis, 1989; Davis, Bagozzi, &amp; Warsaw, 1989; Eisenhardt, 1989; Organ &amp; Konovsky, 1989; Pentland, 1989; Mathieu &amp; Zajac, 1990; Doll &amp; Torkzadeh, 1991; Moore &amp; Benbasat, 1991; Thompson, Higgins, &amp; Howell, 1991; DeLone &amp; McLean, 1992;</p>

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Gist & Mitchell, 1992; March & Simon, 1993; Hartwick & Barki, 1994; Triandis, 1994; Compeau & Higgins, 1995; Goodhue & Thompson, 1995; Igarria & Iivari, 1995; March & Simon, 1993; Rousseau, 1995; Shore & Shore, 1995; Meyer & Allen, 1997; Tsui et al., 1997; Marakas, Yi, & Johnson, 1998; Shore & Barksdale, 1998; Higgins & Huff, 1999; Agarwahl & Karahanna, 2000; Alavi & Leidner, 2001; Eisenberger et al., 2001; Gold et al., 2001; Rhoades, Eisenberger, & Armeli, 2001; Crowe et al., 2002; Adams & Lamont, 2003; Connelly & Kelloway, 2003; Havelka, 2003; Legris, Ingham, & Collette, 2003; Lewis, Agarwahl, & Sambamurthy, 2003; Ndubisi & Jantan, 2003; Venkatesh, 2003; Gong, Xu, & Yu, 2004; Hasan & Ali, 2004; Hsu & Chiu, 2004; Money & Turner, 2005; Cabrera, Collins, & Salgado, 2006; Lee, Kim, & Kim, 2006; Kulkarni, Ravindran, & Freeze, 2007; Lien, Hung, & McLean, 2007; Lin, 2007b; King & Marks, 2008; Lia, 2008; Bartol et al., 2009; Levy & Green, 2009.

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**Section 16. Usage as a factor for contributing knowledge to a Knowledge Management System (KMS) (Construct: USE).**

<b>Item</b>	<b>Operational Declaration: An Intel Analysts belief in his/her ability to use technology (computer) in a new or unfamiliar situation.</b>	<b>Operational Reference from Literature Supporting Survey Instrument Item</b>
<b>USE1</b>	I frequently use a KMS to contribute my knowledge in my work.	Gouldner, 1960; Etzioni, 1961; Bachrach & Baratz, 1962; Levinson, 1965; Kelley, 1967; Kee & Knox, 1970; Hickson et al., 1971; Mulder, 1971; Wofford, 1971; Zand, 1972; Fishbein &

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Ajzen, 1975; Lucas, 1975; Steers, 1977; Gould, 1979; Robey, 1979; Worchel, 1979; Rotter, 1980; Bagozzi, 1981; Lucas, 1981; Pfeffer, 1981; Bagozzi, 1982; Mowday, Porter, & Steers, 1982; Swanson, 1982; Barber, 1983; Bateman & Organ, 1983; Tushman & Romanelli, 1983; Astley & Sachdeva, 1984; Lewis & Weigert, 1985; Bandura, 1986; Brief & Motowidlo, 1986; Cheney, Mann, & Amoroso, 1986; Eisenberg et al., 1986; Goodhue, 1986; Gist, 1987; Swanson, 1987; Dweck & Leggett, 1988; Koller, 1988; Davis, 1989; Davis, Bagozzi, & Warsaw, 1989; Eisenhardt, 1989; Organ & Konovsky, 1989; Pentland, 1989; Burkhardt & Brass, 1990; Kraemer & Pinsonneault, 1990; Mathieu & Zajac, 1990; Doll & Torkzadeh, 1991; MacInnis, Moorman, & Jaworski, 1991; Moore & Benbasat, 1991; Thompson, Higgins, & Howell, 1991; DeLone & McLean, 1992; Gist & Mitchell, 1992; March & Simon, 1993; Herbig, Milewicz, & Golden, 1994; Hartwick & Barki, 1994; Sambamurthy & Chin, 1994; Triandis, 1994; Compeau & Higgins, 1995; Goodhue & Thompson, 1995; Hosmer, 1995; Igarria & Iivari, 1995; Mayer, Davis, & Schooman, 1995; Rousseau, 1995; Shore & Shore, 1995; Tyler & Kramer, 1995; Igarria, Parasuraman, & Baroudi, 1996; Melin & Persson, 1996; Szulanski, 1996; Meyer & Allen, 1997; Smeltzer, 1997; Tsui et al., 1997; Doney, Cannon, & Mullen, 1998; Gambetta, 1998; Jones & George, 1998; Marakas, Yi, &

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Johnson, 1998; Shore & Barksdale, 1998; Bolino, 1999; Higgins & Huff, 1999; Chow, Harrison, McKinnon, & Wu, 1999; Hansen, Nohria, & Tierney, 1999; Rice & Gattiker, 1999; Agarwahl & Karahanna, 2000; Athanassiou & Nigh, 2000; Chow, Deng, & Ho, 2000; Gupta & Govindarajan, 2000; Scott, 2000; Wasko & Faraj, 2000; Alavi & Leidner, 2001; Amabile et al., 2001; Ba, Stallaert, & Whinston, 2001; Clarke & Rollo, 2001; Das & Teng, 2001; Eisenberger et al., 2001; Gold et al., 2001; H. Hall, 2001; Rhoades, Eisenberger, & Armeli, 2001; Yli-Renko, Autio, & Sapienza, 2001; Bartol & Srivastava, 2002; Crowe et al., 2002; Husted & Machilova, 2002; Adams & Lamont, 2003; Connelly & Kelloway, 2003; Ferrin & Dirks, 2003; Ford & Chan, 2003; Havelka, 2003; Legris, Ingham, & Collette, 2003; Lewis, Agarwahl, & Sambamurthy, 2003; Liebowitz, 2003; Maull, Tranfield, & Maull, 2003; Ndubisi & Jantan, 2003; Oldham, 2003; Sawng, Kim, & Han, 2003; Thomas-Hunt, Ogden, & Neale, 2003; Venkatesh, 2003; Das & Teng, 2004; Gong, Xu, & Yu, 2004; Hasan & Ali, 2004; Hsu & Chiu, 2004; Bock, Zmud, Kim, & Lee, 2005; Kankanhalli, Tan, & Wei, 2005; Lucas, 2005; Money & Turner, 2005; Ojha, 2005; Cabrera, Collins, & Salgado, 2006; Kim & Lee, 2006; Lee, Kim, & Kim, 2006; Mooradian, Renzl, & Martzler, 2006; Taylor, 2006; Casalo, Flavian, & Guinaliu, 2007; Jøsang, Ismail, & Boyd, 2007; Kulkarni, Ravindran, & Freeze, 2007; Lien, Hung, & McLean,

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		<p>2007; Lin, 2007b; Søndergaard, Kerr, &amp; Clegg, 2007; Sonnenwald, 2007; Yao, Kam, &amp; Chau, 2007; Abdolvand, Albadvi, &amp; Ferdowsi, 2008; King &amp; Marks, 2008; Liao, 2008; Renzl, 2008; Bartol et al., 2009; Levy &amp; Green, 2009; Subramanian &amp; Soh, 2009; Xu, Kim, &amp; Kankanhalli, 2010; Fehr, Holger, &amp; Wilkening, 2013.</p>
<b>USE2</b>	I frequently use a KMS to contribute my expertise in my work.	<p>Gouldner, 1960; Etzioni, 1961; Bachrach &amp; Baratz, 1962; Levinson, 1965; Kelley, 1967; Kee &amp; Knox, 1970; Hickson et al., 1971; Mulder, 1971; Wofford, 1971; Zand, 1972; Fishbein &amp; Ajzen, 1975; Lucas, 1975; Steers, 1977; Gould, 1979; Robey, 1979; Worchel, 1979; Rotter, 1980; Bagozzi, 1981; Lucas, 1981; Pfeffer, 1981; Bagozzi, 1982; Mowday, Porter, &amp; Steers, 1982; Swanson, 1982; Barber, 1983; Bateman &amp; Organ, 1983; Tushman &amp; Romanelli, 1983; Astley &amp; Sachdeva, 1984; Lewis &amp; Weigert, 1985; Bandura, 1986; Brief &amp; Motowidlo, 1986; Cheney, Mann, &amp; Amoroso, 1986; Eisenberg et al., 1986; Goodhue, 1986; Gist, 1987; Swanson, 1987; Dweck &amp; Leggett, 1988; Koller, 1988; Davis, 1989; Davis, Bagozzi, &amp; Warsaw, 1989; Eisenhardt, 1989; Organ &amp; Konovsky, 1989; Pentland, 1989; Burkhardt &amp; Brass, 1990; Kraemer &amp; Pinsonneault, 1990; Mathieu &amp; Zajac, 1990; Doll &amp; Torkzadeh, 1991; MacInnis, Moorman, &amp; Jaworski, 1991; Moore &amp; Benbasat, 1991; Thompson, Higgins, &amp; Howell, 1991; DeLone &amp; McLean, 1992; Gist &amp; Mitchell, 1992; March &amp; Simon, 1993; Herbig, Milewicz, &amp; Golden,</p>

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Han, 2003; Thomas-Hunt, Ogden, & Neale, 2003; Venkatesh, 2003; Das & Teng, 2004; Gong, Xu, & Yu, 2004; Hasan & Ali, 2004; Hsu & Chiu, 2004; Bock, Zmud, Kim, & Lee, 2005; Kankanhalli, Tan, & Wei, 2005; Lucas, 2005; Money & Turner, 2005; Ojha, 2005; Cabrera, Collins, & Salgado, 2006; Kim & Lee, 2006; Lee, Kim, & Kim, 2006; Mooradian, Renzl, & Martzler, 2006; Taylor, 2006; Casalo, Flavian, & Guinaliu, 2007; Jøsang, Ismail, & Boyd, 2007; Kulkarni, Ravindran, & Freeze, 2007; Lien, Hung, & McLean, 2007; Lin, 2007b; Søndergaard, Kerr, & Clegg, 2007; Sonnenwald, 2007; Yao, Kam, & Chau, 2007; Abdolvand, Albadvi, & Ferdowsi, 2008; King & Marks, 2008; Liao, 2008; Renzl, 2008; Bartol et al., 2009; Levy & Green, 2009; Subramanian & Soh, 2009; Xu, Kim, & Kankanhalli, 2010; Fehr, Holger, & Wilkening, 2013.

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## Appendix C

## IRB Approval Letter (NSU)

NOVA SOUTHEASTERN UNIVERSITY  
Office of Grants and Contracts  
Institutional Review Board



## MEMORANDUM

**To:** Robert J. Hambly, Jr.  
**From:** Ling Wang, Ph.D.  
Institutional Review Board

**Date:** Sep. 2, 2014

**Re:** *An Empirical Investigation of the Willingness of Analysts to Contribute to Knowledge Management System (KMS) in a Highly Classified and Sensitive Environment of the US Intelligence Community*

**IRB Approval Number:** wang08151404

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I have reviewed the above-referenced research protocol at the center level. Based on the information provided, I have determined that this study is exempt from further IRB review. You may proceed with your study as described to the IRB. As principal investigator, you must adhere to the following requirements:

- 1) **CONSENT:** If recruitment procedures include consent forms these must be obtained in such a manner that they are clearly understood by the subjects and the process affords subjects the opportunity to ask questions, obtain detailed answers from those directly involved in the research, and have sufficient time to consider their participation after they have been provided this information. The subjects must be given a copy of the signed consent document, and a copy must be placed in a secure file separate from de-identified participant information. Record of informed consent must be retained for a minimum of three years from the conclusion of the study.
- 2) **ADVERSE REACTIONS:** The principal investigator is required to notify the IRB chair and me (954-262-5369 and 954-262-2020 respectively) of any adverse reactions or unanticipated events that may develop as a result of this study. Reactions or events may include, but are not limited to, injury, depression as a result of participation in the study, life-threatening situation, death, or loss of confidentiality/anonymity of subject. Approval may be withdrawn if the problem is serious.
- 3) **AMENDMENTS:** Any changes in the study (e.g., procedures, number or types of subjects, consent forms, investigators, etc.) must be approved by the IRB prior to implementation. Please be advised that changes in a study may require further review depending on the nature of the change. Please contact me with any questions regarding amendments or changes to your study.

The NSU IRB is in compliance with the requirements for the protection of human subjects prescribed in Part 46 of Title 45 of the Code of Federal Regulations (45 CFR 46) revised June 18, 1991.

**Cc:** Protocol File

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