Chapter 4

INFORMATION DISSEMINATION AND KNOWLEDGE MANAGEMENT FOR ORGANIZATIONAL PERFORMANCE ENHANCEMENT

Chapter Objectives: This work emphasizes on understanding of the principles of Information and knowledge management and realizes the significance of "Information and knowledge security". The need for protection of knowledge and information has been vehemently recommended and emphasized if the company wants to propel for success. To develop "knowledge creation model" for attainment of sustainable competitive advantage- by conversion of collected information by Externalization, Socialization, Internalization and Assimilation. The model has been named as Sahai-Grover "ICESIA Model".

4.1 Introduction:

For an organization to capitalize on its knowledge and truly become a learning organization, it must begin to systematically manage and leverage knowledge existing internally and externally to create and sustain its competitive advantage.

Michelle M. S. Phang* and Soon-Yau Foong**June 2007,

Most of the problems that may occur in any organization are the result of inadequate and inappropriate transfer of information and poor communication. Large warehouses of information are available from the various sources like Internet, intranet, wireless, satellite, TV, business news, advertisements, and conferences etc. A huge amount of useful information can be gathered by environmental scanning. Environmental scanning is the acquisition and use of information about events, trends, and relationships in an organization's external environment, the knowledge of which would assist management in planning the organization's future course of action Aguilar (1967), Choo & Auster (1993). Environmental scanning is done in order to avoid surprises, identify threats and
opportunities, gain competitive advantage, and improve long-term and short-term planning (Sutton 1988). Sometimes, if the information is not required in the form it is available, it is then to be filtered or selectively disseminated and used. This is called Selective Dissemination of Information (SDI). Fig 4.1 represents the SDI model for competitive advantage by value creation.

Figure: 4.1 Selective Dissemination of Information-Model for competitive advantage.

Dissemination of salient knowledge is surmise to impact the formation of competitive advantage. The two most cited mediating factors for ensuring proper dissemination of knowledge are communication facilitation and organizational culture development. Buckman (1998) argues that one of the central purposes of knowledge management and sharing is to facilitate communication across all of the organization’s boundaries, so that the entire company works together to address given business challenges and seize covert opportunities. A key in overcoming tendencies of employees to hoard knowledge or to remain cautious in sharing ideas with others is for management to take the lead in creating an environment of understanding, shared control, compassion, and learning. All ideas set forth in good faith and backed by rational analysis should be reinforced as beneficial to the company’s efforts to create a cauldron of strategic innovation, even if such shared knowledge does not immediately produce resounding results. The concept of knowledge management concerns the creation of structures that combine the most
advanced elements of technological resources and the indispensable input of human
response and decision-making Raisinghani (2000). In this way, knowledge managers
need to look at specific tools and tactics that will encourage collaborative and productive
exchange between employees. Managing knowledge flow is a crucial step in moving the
asset of quiescent knowledge into actualization Fahey & Prusak (1998). With efficient
dissemination of knowledge, the company's ability to make impacting decisions
increases dramatically, because individuals throughout the firm gain access to important
strategic ideas, rather than merely retaining this knowledge within the ranks of high-level
management. By giving employees access to each other, rather than going through
vertical channels of upper management, those with the most current knowledge can share
it with those who will benefit most from it DeTienne & Jackson (2001). This improves
the organization's ability to make rapid decisions and execute them effectively.
Disseminated information when critically analyzed and filtered becomes selectively
Disseminated Information (SDI). SDI, after a careful analysis by the intellectual assets of
organization becomes usable information and knowledge and value is created. Value
creation is presented often after the development of new products and services that
increase the utility that customers obtain from them. When a firm sustains profits that
exceed the average for its industry, the firm is said to possess "Competitive Advantage"
over its rivals. The goals of whose business is to achieve competitive advantage. A
sustainable competitive advantage finally is due to improved performance. Pfeffer &
Sutton (2000) maintain that to create a culture appropriate for transforming tacit
knowledge into communal, explicit knowledge, fear-based approaches to management
must be abandoned. Pfeffer & Sutton (2000) argue that competitive advantage goes not to
those firms who have the best knowledge, but to those who use knowledge the best.
Selective Dissemination of Information involves timely distribution of information to a
large number of customers like people in stock exchange markets, traffic departments,
sports etc. All the relevant information is summed up deleting the irrelevant. The useful
and relevant information is critically examined by the interaction with the intellectuals of
the organization to create useful knowledge. An organization which is rich in its
intellectual assets always adopts a healthy approach in formulating the policies of the
organization and for its people. Knowledge is defined as what we know. Knowledge
involves the mental processes of comprehension, understanding and learning that go on in the mind and only in the mind, however much they involve interaction with the world outside the mind, and interaction with others. Whenever we wish to express what we know, we can only do so by uttering messages of one kind or another - oral, written, graphic, and gestural or even through 'body language'. Such messages do not carry 'knowledge', they constitute 'information', which a knowing mind may assimilate, understand, comprehend and incorporate into its own knowledge structures. These structures are not identical for the person uttering the message and the receiver, because each person's knowledge structures are, as Schutz (1967) puts it, 'biographically determined'. Therefore, the knowledge built from the messages can never be exactly the same as the knowledge base from which the messages were uttered.

'Baker et.al, (1997) define knowledge in the form of simple formula:
Knowledge = Information + [Skill + Experience + Personal Capability]. Bender and Fish (2000) consider that knowledge is in the head of an individual (the mental state of having ideas, judgments, talents, root causes, relationship, perspectives and concepts).

Knowledge management is emerging as a key concern of organizations, particularly those who have already redesigned their business processes and embedded a total quality approach into their practices.

Knowledge Management is dealing “with the process of creating value from an organization’s intangible assets” and is about “the conceptualization, review, consolidation and action phases of creating, securing, combining, coordination and retrieving knowledge”Liebowitz (1999, p. iii f.). Major consulting firms are now gearing up to add knowledge management to their lines of business. Knowledge management is about enhancing the use of organizational knowledge through sound practices of information management and organizational learning. The purpose is to deliver value to the business.

Managing Information Flow → Capturing Organizational Learning → Leveraging Knowledge Bases → Sustained Business Value

Figure: 4. 2. Use of knowledge rests on managing information and learning
Figure 4.2 shows the relationship between the four components, (viz managing information, capturing organizational learning, leveraging knowledge bases and sustaining business values) indicating that knowledge management is more than managing information flows. It rests on two foundations: utilizing and exploiting the organization's information (which needs to be managed for this to occur); and second, the application of people's competencies, skills, talents, thoughts, ideas, intuitions, commitments, motivations, and imaginations Harari O (1994). Knowledge Management has become not only a huge body of literature, but also a widespread organizational practice Easterby-Smith and Lyles (2003), Spender (2005).


- Complexity
- Tacitness and,
- Context specificity.

If technological knowledge has to be a source of competitive advantage, then it not only becomes necessary to examine how it leads to product and process innovation within the firm but also whether and when this knowledge will dissipate to the firm's competitors. The imitation barrier that protects a firm is defined by the rate of this involuntary dissipation of its knowledge. The barrier is influenced in parts by legal action that a firm can take to protect its intellectual property, through patent protection as well as non-disclosure clauses in its contracts with the suppliers and employees. Imitation barriers are also determined by characteristics of its technological knowledge. Each characteristic can be looked upon with its ability to thwart knowledge dissipation through reverse engineering, intelligence gathering, and raiding of its key employees.

4.2.1 Complexity: -- It implies difficulty in comprehending Dierickx and Cool (1989), McEvily and Chakravarthy (2002). A complex system is one that consists of many unique and interacting elements, which have equally important effects on the outcomes
produced by the system. Technological knowledge is more complex when many different but equally important factors such as components affect product performance. Complexity should slow performance replication by making reverse engineering more difficult MacMillan *et al.*, (1985). When many components have relatively equivalent effects on performance, competitors cannot accelerate replication by focusing on core components. Moreover any such search is likely to be expensive. Intelligence gathering is also difficult when target knowledge is complex. A greater amount of information is to be gathered for rival to replicate a firm’s knowledge, Winter (1987). Competitors have to contact several suppliers and employees before they can understand all of the key component pieces and their contribution to performance. Information that is obtained through product specification sheets or other published materials on the firm’s products is apt to provide proportionately less insight into the complete set of technical relationships underlying product performance. Competitors will also require time to reconstruct information that is obtained in small fragments. Complexity also limits a competitor’s ability to access a firm’s knowledge by hiring away its employees. No single individual is, therefore, a security threat. Further each individual employee’s productivity, when working with a complex knowledge, depends upon his or her relationship with other employees. If an employee leaves to work for another firm, he or she loses access to that particular set of complimentary skills and may not be as productive in achieving the same performance outcomes in another firm.

The hypothesis derived is that: *The complexity of technological knowledge will be positively related to the persistence of a firm’s product performance advantage.*

4.2.2 Tacitness: It is the extent to which the knowledge is codifiable or not Nonaka and Takeuchi (1995). Successful innovation comes from the mobilization and conversion of tacit knowledge through four modes of knowledge conversion - Socialization, Externalization, Combination and Internalization (fig 4.3). The technical knowledge is tacit when the experts with in the firm have an incomplete understanding of the casual mechanisms that drive the performance of its products and processes Bohn (1994), Polanyi (1962); Nelson & Winter (1982). While the experts may have an intuitive understanding of these casual mechanisms, they are unable to articulate it for their
colleagues. When the underlying technological knowledge behind a product is tacit, it is obviously impossible to access it through reverse engineering. Further, when technological knowledge is tacit, it may prolong a firm's performance advantage because it reduces the amount of information that employees can share with their peers in other organizations, or with suppliers and customers who might deliberately or inadvertently pass the information along. Stated indirectly, since a very few of the relationships affecting performance can be articulated, competitors can only acquire partial knowledge through their intelligence gathering activities. Tacit knowledge tends to be more context specific Barney (1992), Arora & Gambardella, (1994). The more tacit the individual's knowledge of product performance, the lesser productive that person is apt to be in another organizational setting.

Our next hypothesis becomes:

"Tacitness of technological knowledge will be positively related to the persistence of a firm's product performance advantages."

4.2.3 Context specificity - Is the extent to which knowledge is contextualized and dependent on the environment Nelson and Winter (1982). The technological knowledge is specific when it is tailored for new product niches. Specificity can be of two types:

4.2.3.1 Resource specificity - It refers to how limiting is a firm's knowledge in manipulating input resources to produce superior performance in one product to other applications.

4.2.3.2 Design specificity. - It captures the extent to which the architectural knowledge embodied in a firm's product is valuable in other applications. If a firm uses unique components and design to serve each customer application area, its competitors will have less of opportunity to see a clear structure in the firm's knowledge. Moreover, it is less likely that they have an understanding of application context. Therefore, reverse engineering will be more difficult.

In addition, the product itself may be less accessible to the competitors since the customized technologies are often sold directly, rather than through more visible retail or wholesale distribution channels. Intelligence gathering is made more difficult by the narrow set of customers and suppliers that the lead firm has. There are fewer potential
sources of knowledge leak. Even from these sources, competitors may find it difficult to extract useful information because of their own lack of familiarity with the application context.

While it is possible to access the specific knowledge of a lead firm by hiring away its key employees, this is not very likely for two reasons. First, given the difficulties in intelligence gathering, it may be more difficult to identify who the key employees are? Secondly there is the risk that the expert who is raided may not be able to transfer his or her specialized knowledge to the input resources and design architecture that the competitor chooses to use. Thus the final hypothesis derived is:

"The specificity of technological knowledge will be positively related to the persistence of the firm's product performance advantages".

Besides, other characteristics include:

4.2.3.3 Dispersion – how widely held is the knowledge Weick and Roberts (1993);

4.2.3.4 Transferability – It refers to transfer between and within firms Grant (1996b). The adequate management of knowledge transfers is considered a key factor for improving the organization's performance and long-term survival. The relationship between the principles and practices considered appropriate in literature on quality management, as well as on knowledge management, do, to a great extent, coincide.

4.2.3.5 Reception or absorption – It is the ability to absorb knowledge Cohen and Levinthal (1990); and if knowledge is determined to be the most important resource of the firm, then clearly the need to secure that resource must be a primary responsibility.

4.3 Governance of Organization / creating competitive advantage through Knowledge Management: The sharing of knowledge among employees is a vital component of the knowledge management activities Cabrera and Cabrera (2002), Jarvenpaa and Staples (2000), Nahapiet and Ghoshal (1998), Wasko and Faraj (2000). In information and knowledge dynamic system / environment, the adaptation of the approaches utilizing the principles of the knowledge management provide a leading edge
to the creation of competitive advantage. The following three approaches have been studied.

1. Knowledge Governance Approach

2. Knowledge Dynamic Approach

3. Knowledge Creation approach

4.3.1 Knowledge Governance Approach: The organizational governance through ‘Knowledge Management’ is an emerging approach and has caught momentum during nineties only. It is characterized as a distinctive approach that cuts across the fields of knowledge management, organization studies, strategy, and human resource management. The approach may briefly be defined as a sustained attempt to uncover how knowledge transactions which differ in their characteristics and governance mechanisms and which differ with respect to, how they handle transactional problems, are matched, using economic efficiency as the explanatory principle. The approach starts from the hypothesis that knowledge processes (i.e., the creation, retention, and sharing of knowledge; Argote (1999) can be influenced and directed through the deployment of governance mechanisms, in particular the formal aspects of organization that can be manipulated by management, such as organization structure, job design, reward systems, information systems, standard operating procedures, accounting systems, and other coordination mechanisms Grandori (2001). The Knowledge Governance Approach (KGA) asserts that such governance mechanisms should be seen as critical antecedents of knowledge processes. KGA in the overall “knowledge movement,” that is, the broad interest in the management of knowledge that has characterized many fields in business administration during the last decade.

4.3.2 Knowledge Dynamic Approach. “Knowledge” has been all the rage for more than a decade in a number of fields in management studies [e.g., Grandori and Kogut (2002), Eisenhardt and Santos (2003). A “knowledge movement” that cuts across traditionally separate disciplines in business administration has emerged. The strategic field has witnessed a proliferation of approaches that all place knowledge at the center stage (e.g., Grant (1996), Spender (1996), Kogut and Zander (1996) the international business field is
in the process of developing a view of the multinational corporation as a knowledge-based entity Tallman (2003); network ideas that stress connections between knowledge nodes, often based on sociological notions of network ties Granovetter (1973) are becoming increasingly influential Kogut (2000), Tsai (2001 & 2002) and of course, KM has become not only a huge body of literature, but also a widespread organizational practice Easterby-Smith & Lyles (2003), Spender (2005). It is appropriate to characterize all this as a “knowledge dynamics” because of the shared conviction that the management of knowledge of whatever kind has become a critical issue for competitive dynamics, international strategy, the building of resources, the boundaries of firms, and many other issues. There is also agreement that it is meaningful to speak of different kinds of knowledge, each fulfilling different management needs. And there seems to be an inbuilt pluralism to the knowledge movement, an agreement that no single established business administrative field or social science perspective is likely to carry us all the way towards a comprehensive understanding of the management of knowledge. There are organizations where a significantly larger part of value-added can be ascribed to human than to physical assets. They range from R&D-intensive manufacturing firms to professional services firms, and rely on “scarce expert talent.” Such organizations are called “Human Capital Organizations” and are dominating Physical Capital Organizations. Such organizations show an increase of the “knowledge-content” in outputs, a stepping up of innovative activity, an increasing differentiation of demand, increasing globalization, and increasingly inexpensive networked computing complementary changes that are taken to indicate the emergence of the “knowledge economy” Halal and Taylor (1998) or at least a new paradigm of “modern manufacturing” Milgrom and Roberts (1990).

4.3.3 Knowledge creation approach: Nonaka, Takeuchhi, and Umemoto (1996) defined the knowledge creation process as a “never-ending spiral of tacit and explicit knowledge through four modes of knowledge conversion” (p. 833).

- Combination
- Internalization
- Socialization and,
- Externalization
By interaction process the tacit knowledge gets transformed into explicit knowledge and vice versa. Fig 4.4 represents the process of knowledge creation by interaction.

**Figure 4.3 The knowledge sharing model. Source: Adopted from Nonaka (1996)**

![Knowledge Sharing Model](image)

**Figure: 4.4 Creation of Human Knowledge by interaction between tacit and explicit knowledge**

This framework is based on the dichotomy between tacit knowledge and explicit knowledge as well as the distinctions between individual knowledge and collective knowledge. Further through initial team member socialization, tacit knowledge can be created, which possibly leads to a sustained competitive advantage for the firm. Knowledge may be considered as a fluid mix of framed experience, Values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knower. Knowledge can be viewed as divided into tacit and explicit knowledge Polanyi (1966). Tacit knowledge is tied to an individual and is very difficult if not impossible to articulate. As knowledge is explored, put into action, and socially justified, tacit knowledge is being made explicit through codification resulting in its being converted into messages that can be processed as information. The purpose of this study
is to provide an integrated framework for exploring the relationship among the life-span of self-directed project development teams, the knowledge creation process and sustained competitive advantage given in today’s increasingly dynamic environment. To keep pace with the dynamic business environment, teams are becoming more widely used. Hackman (1998) concluded that, “Teams markedly outperform individuals, and self-managing teams do best of all” (p.245). Knowledge has emerged as the most strategically significant resource of the firm Grant (1996a) and is built into the very nature of the firm Penrose (1959). This study examines two life-span theories of project teams and then proposes how tacit knowledge creation during the team’s life-span can lead to creating a sustained competitive advantage. The team cannot create new knowledge without the individual and so the team needs to support individual team members and provide contexts for them. A critical assumption is “that tacit knowledge and human knowledge is created and expanded through social interaction between and explicit knowledge” Nonaka, Takeuchhi, & Umemoto (1996, p. 835). During the socialization mode, team members share experiences and mental models.

During the externalization mode, team members articulate their hidden tacit knowledge using meaningful dialogue and reflections. During the combination mode, newly created knowledge and existing knowledge from internal and external sources are crystallized into new products. During the internalization mode, learning-by-doing triggers the creation of tacit knowledge. Thus, the knowledge creation process is a spiral process starting at the individual level, organizational knowledge working through the team and ultimately crossing the boundaries of the organization. In this spiral process, the socialization within the team plays a critical role in creating new tacit knowledge that can lead to creating a competitive advantage. To keep pace with the dynamic business environment, team utilization approach is becoming more popular and widely used. Thus, tacit knowledge can form the basis of a sustainable competitive advantage. Kogut and Zander (1992) view the firm as a social community. One way to prevent diffusion of tacit knowledge because of employee turnover is through a firm’s social structure Droge & Hoobler (2003). This can be done by promoting employee interaction and collaboration, which is consistent with self-managed teams.
The following model (Fig 4.5) is an improved version of the model proposed by Nonaka et al. (1996). Instead of four factors taken by Nonaka et al. (1996), five factors, namely Information Collection, Extrinsic knowledge, Socialization, Intrinsic knowledge and, Assimilation, have been taken wherein one more factor "Information Collection" has been added. This model has been named as Sahai-Grover “ICESIA” model. The first step of knowledge creation comes from “Information collection” and then by Assimilation of intrinsic knowledge with extrinsic knowledge through socialization process, which is analogous to information / knowledge creation and sharing

- Information Collection (IC)
- Externalization / Extrinsic knowledge (E)
- Socialization (S)
- Internalization / Intrinsic knowledge (I)
- Assimilation (A)

**Figure 4.5 Knowledge creation model for attainment of sustainable competitive advantage (Sahai-Grover ICESIA Model)**

Intrinsic knowledge is what you know without even realizing that you know it. It is the knowledge and thought processes that you take for granted that you think everyone knows but that they really don't. By taking the time to work out what information you know, you can pass it on to someone that might be taking your place at some point down
the line. Extrinsic knowledge refers to the knowledge gathered from the outside environment and socialization and interaction with the people, for example by interaction with customers, vendors or contractors etc.

4.4 Information and knowledge sharing for competitive advantage: In the recent years, there is an increasing interest in how a firm can use its Information and Communication Technology, (ICT) to facilitate knowledge sharing. A significant body of literature has explored the relationship between ICT and knowledge sharing in general Bolisani and Scarso (1999), Hendriks (2001), Luan and Serban (20020), Roberts (2000), Johnson (2003), Robertson et al., (2002), Song (2002), Sproull and Kiesler (1986). Socialization is the sharing of tacit knowledge such as mental models and technical skills between individuals Nonaka (1994); Nonaka and Konno (1998), Seufert et al., (2003). Nonaka and Konno (1998) suggest that tacit knowledge is shared through joint activities, such as spending time together and being in the same environment. Informal networks are especially crucial for this process. Externalization is the conversion of tacit knowledge into explicit knowledge, involving the transformation of one's idea, experience or insight into readily understandable form or formal models Bolisani and Scarso (1999), Nonaka and Konno (1998), Seufert et al., (2003). Combination is the conversion of explicit knowledge into more systemized or complex sets of explicit knowledge Nonaka and Konno (1998), Seufert et al., (2003) and making it more usable. Internalization is the conversion of explicit knowledge into tacit knowledge Nonaka and Konno (1998), Seufert et al., (2003). When explicit knowledge is internalized into an individual's tacit knowledge, a shared mental model is formed within the firm, thereby starting a new spiral of knowledge conversion. As the interaction among these four processes iterates, it facilitates the exchange, refinement and extension of organizational knowledge. According to Bresman, Birkinshaw and Nobel (1999: 440), the process of knowledge transfer between business units is an essential aspect of knowledge management, and Tseng (2006: 121) notes that knowledge transfer capability is one of the most important advantages of Multi National Companies (MNCs) and that “through the transfer and adaptation of knowledge, subsidiaries of MNCs build and develop their competitiveness over local firms”. Indeed, the management of knowledge flows is especially important for multinational companies because they operate in geographically and culturally diverse
environments Schulz et al.,(2001). Since strategically important knowledge is geographically dispersed in the business environment of most global firms Asakawa et al., (2003), MNCs can derive great competitive advantage by managing knowledge flows between their sub units with differences between local markets requiring adaptation of products and operations to local conditions Haghirian & Kohlbacher (2005), Schulz et al., (2001). Mindbaeva and fellow researchers (2003: 587) contend that the competitive advantage that MNCs enjoy is contingent upon their ability to facilitate and manage intersubsidiary transfer of knowledge and define knowledge transfer between organizational units as “a process that covers several stages starting from identifying the knowledge over the actual process of transferring the knowledge to its final utilization by the receiving unit”. Collaborative experience of the firm makes the information and skills gained from the alliance an integral component of the information facilitating behaviours that influence alliance performance Ahuja (2000). As Zahra, Ireland and Hitt (2000) state “some of this knowledge is tacit, making it difficult to use unless it is integrated into the firm’s operations”.

4.5. Risks involved in sharing of Knowledge and Information.

Oxley and Sampson (2004) identified five issues that may be internalized by the partner when collaborating. These have been represented in fig.4.6 which can lead to the loss of competitive advantage if not dealt with care.

- Loss of strategic and R &D knowledge
- Loss of competitive benchmarking data
- Employee poaching
- Loss of explicit / codified knowledge
- Exposure of tacit knowledge and embedded skills.

If collaboration is done, the collaborating organization always runs the risk of loosing R & D Benchmarking data to the partnering organization. Further, the employee poaching is possible which can also result in the loss of “tacit” as well as “codified knowledge”.

70
Figure: 4.6 showing risks involved in sharing of Knowledge and Information in relation to competitive advantage

4.5.1 Strategic approach to risk management: The strategies for protection of knowledge important for managing this flow are mostly relating to the staff. A few of them can be for example:

- **Retaining staff:** Poaching often happens in situations where the people feel that their work is more valued in the partner firm, and starts to develop loyalty towards the partner firm instead of the parent firm Pitsis, Komberger & Clegg (2004). However, this issue could be solved by obliging the employees to sign an agreement not to accept competing job offers, before leaving for the second.

- **Ensuring Loyalty:** In collaborative projects it is equally important that employees feel a sense of loyalty towards their parent company, as this will influence their behaviour when interacting with staff from other firms. One of the important measures for creating loyalty includes team branding so that people feel part of the team.

- **Conventions of professionalism:** Through the development of conventions of professionalism the employees are expected to explicitly consider the need for
professional behaviour at all times as they often are located in the partner’s premises.

- **Gate keeping:** No document may leave the organization without the correct signature on it, and only certain people are allowed to sign such documents.

- **Utilization of reputation:** Reputation is an integral part of relational capital and can also function as a protection strategy. The reputation of a firm is taken into account when choosing between potential partners. Consequently, untrustworthy behaviour on behalf of a firm will have a negative impact on the negotiation strength of that firm when finalizing collaborations.

- **Guarding customer relationship:** The biggest concern we have is our client relationships. It is very dependent on its relational capital, both for maintaining partners and finding new suitable partners and customers.

4.6. **Information and knowledge security or protection for competitive advantage:** In this era of heightened security for domestic and global organizations, protection of corporate assets is a vital concern. Knowledge management and protection of knowledge assets is emerging as a field of study that with many ideas yet to be fully tested, issues to be resolved, and organizational learning that needs to be done. Unified and formal knowledge models of the information security domain are fundamental requirements for supporting and enhancing existing risk management approaches. Risk analysis is the starting baseline that helps to choose what technical and procedural security measures an organization must employ. In spite of its importance, due to its complexity and its relative immaturity, this issue burdens on the arm of security experts at the moment, with little automation of the process. Information Security is usually outlined as the “preservation of confidentiality, integrity and availability of information” while “other properties such as authenticity, accountability, non-repudiation and reliability can also be involved” (ISO/IEC, 2005, p. 2). “People are the cornerstone of [information] security” Bishop and Frincke (2005, p. 49). In knowledge management (KM) research and implementation - security and privacy in an environment where people are being encouraged to share and collaborate - both directly and through various technology mediated systems may seem like adding privacy and security aspects to what is intended as an ‘open’ system may create a certain amount of ideological dissonance. Information Security Management can
thus be defined as the management of activities being aimed at the confidentiality, integrity and availability of organization-internal information. The security and privacy aspects of KM can be of significant benefit. Some human workplace factors may be needed to be considered that will foster an atmosphere of empowerment and trust for employees who engage in KM activities.

4.7. Similarities in Knowledge Management and Information Security Management:
Both the fields, Knowledge Management and Information Security Management, are rated highly important by organizations and share from an abstract point of view some common characteristics that suggest translating established solutions from one area to the other.

4.7.1 Dependence on People: Success of both disciplines heavily depends on people. In Knowledge Management, people have to share their individual—tacit as well as explicit—knowledge with others to form and establish a comprehensive body of knowledge which can be used (and thus profited from) all over the organization. This body of knowledge has in turn to be capitalized by other members of the organization. The same is true for Information Security. After decades of mainly technical approaches to Information Security, it is now widely accepted that “people are the cornerstone of [information] security” Bishop and Frincke (2005, p. 49). To make Information Security work, people have to behave in a secure manner, must not circumvent established security mechanisms and procedures, and should develop a sense for making the right decision in case of unforeseen events. Thus, a strong dependence on people’s behavior can be identified as a first similarity between Knowledge Management and Information Security Management.

4.7.2 Production of Public Goods: Both the areas aim at the production of what economists call public goods. In economic theory, public goods are defined as being non-rival in consumption, this means that any usage of the good does not decrease its value or availability for others, and non-excludable, meaning that nobody can be barred from making use of the good. At least for the scope of the organization, these characteristics apply to Knowledge Management as well as to Information Security Management. Knowledge Management is conducted to create and sustain a body of knowledge that can be used all over the organization to generate profit. Making use of this existing
knowledge results in a higher working efficiency. It would therefore be counterproductive for an organization to exclude any of its members from using an existing body of knowledge for daily work, resulting in non-exclusive treatment of knowledge. Good knowledge, if once produced can be used repeatedly at minimal or even at zero costs leading to non-scarcity. If one member uses existing knowledge, this does in no way limit or constrains its utility for other members. The same is true for Information Security. Information Security does not decrease for any individual member of an organization as a result of another member making use of it.

4.7.3 Positive Effect on Exclusively Usable Knowledge: A positive effect on the exclusively usable knowledge of an organization is a third similarity of Knowledge Management and Information Security Management. Knowledge Management is aimed at enhancing visibility and accessibility of an organization’s existing knowledge for every member. Individual knowledge has to be divulged organization-wide to increase the amount of organization’s internal knowledge that can be used by any individual (to generate profit for the organization as a whole). For organizations, this profit-increasing effect is most significant for internal knowledge not being available to rivals and thus representing a competitive advantage. In short, knowledge that can be used by all members of an organization promises higher profits than individual knowledge and knowledge that remains secret from competitor’s promises higher profits than knowledge that is publicly available. Knowledge Management is thus aimed at expanding the body of exclusively usable knowledge. As mentioned above, confidentiality, integrity and availability of information are the classical main goals of Information Security. By applying these goals to the body of exclusively usable knowledge, it becomes clear that Information Security Management is not directly aimed at increasing this body, but rather at preventing its decrease in confidentiality.

4.7.4 Optimization Challenge: Knowledge Management and Information Security Management both represent optimization challenges. Too much business security increases costs and reduces potential revenue streams substantially” Björck (2001, p. 1) Even if many Information Security investments might have a positive payoff; there will always be a point from where on additional security investments will result in a negative
payoff. Optimization challenge for Information Security Management is to find the level of security where the marginal benefit of an additional countermeasure equals its marginal costs. In both fields, the optimization challenge is finding the point from where on additional efforts would be counterproductive.

4.8 Concluding Remarks:

Most of the problems that may occur in any organization are the result of inadequate and inappropriate transfer of information and poor communication. Dissemination of salient knowledge is surmised to impact the formation of competitive advantage. Environmental scanning is necessary to avoid surprises, identify threats and opportunities, gain competitive advantage, and improve long-term and short-term planning for better performance.

Management should take the lead in creating an environment of understanding, shared control, compassion, and learning.

Competitive advantage goes not to those firms who have the best knowledge, but to those who use knowledge best.

Knowledge = Information + [Skill + Experience + Personal Capability]

The knowledge creation process as a “never-ending spiral of tacit and explicit knowledge through four modes of knowledge conversion” Socialization, Externalization, Combination, and Internalization Nonaka, Takeuchi & Umemoto (1996).

One more dimension namely ‘Information collection’ has been added to Nonaka, Takeuchi & Umemoto (1996) model to create a newer model designated as “Sahai-Grover ICESIA model”. ICESIA model for knowledge creation leads to higher performance levels as knowledge is key and dominant.

The three important identified characteristics of technological knowledge include complexity, Tacitness and Specificity. The complexity of technological knowledge will be positively related to the persistence of a firm’s product performance advantage.

Complexity should slow performance replication by making reverse engineering more difficult.

Tacitness of technological knowledge will be positively related to the persistence of a firm’s product performance advantages.
The specificity of technological knowledge will be positively related to the persistence of the firm’s product performance advantages.

Information Security is usually outlined as the, preservation of confidentiality, integrity and availability of information, while other properties such as authenticity, accountability, non-repudiation and reliability can also be involved.

Knowledge Management and Information Security Management are rated highly important by organizations.

There exist similarities in Knowledge management and Information Security Management. Both are characterized by:

- Dependence on People,
- Production of Public Goods and,
- Positive Effect on Exclusively Usable Knowledge
- Optimization challenges

Knowledge Management and Information Security Management both represent optimization challenges. Too much business security increases costs and reduces potential revenue streams substantially.

Even if many Information Security investments might have a positive payoff; there will always be a point from where on additional security investments will result in a negative payoff.

A model has been developed for competitive edge by the use of selective dissemination of information.

A relationship between the following:

(a) Information flow
(b) Capturing organizational learning
(c) Leveraging knowledge has been established for sustained business value to enhance organizational performance. ICESIA model for knowledge creation leads to higher performance levels as knowledge is key and dominant.