Perspectives on Introducing Enterprise Knowledge Management [1] [2]

Karl M. Wiig
Knowledge Research Institute, Inc., 5211 Vicksburg Dr., Arlington, TX 76017-4941 USA
karlwiig@onramp.net

OVERVIEW

Knowledge Management (KM) is pursued actively by many organizations to improve and sustain their viability and success. Most enterprises tailor KM practices to their needs, environments, and perspectives. Hence, from a tactical perspective, KM practices tend to focus on four areas as indicated in Figure 1. Some focus on knowledge sharing among individuals or on building elaborate educational and knowledge distribution capabilities. Some emphasize use of technology to capture, handle, and locate knowledge (initially, many focus on information management rather than management of knowledge[3]). Others focus on better knowledge utilization to improve effectiveness. Still others pursue building and exploiting intellectual capital to enhance the economic value of the enterprise. Additionally, a few advanced enterprises pursue all four foci as a central strategic thrust. Some have gone even further to create a "knowledge-vigilant" environment to make the enterprise act intelligently in the interest of long-term success and viability.

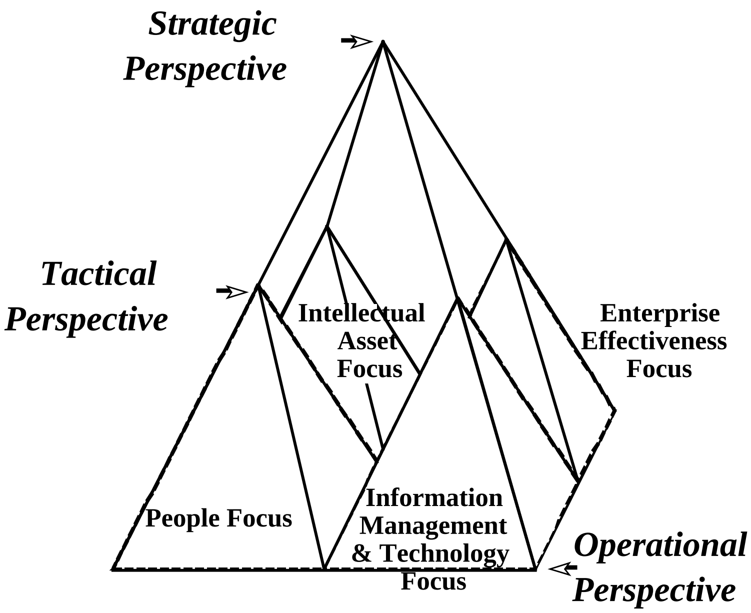

Figure 1. The Four Knowledge Management Focus Areas.

Proc. of the 2nd Int. Conf. on Practical Aspects of Knowledge Management (PAKM98)
Basel, Switzerland, 29-30 Oct. 1998, (U. Reimer, ed.)
http://sunsite.informatik.rwth-aachen.de/publications/CEUR-WS/Vol-13/

[2] This paper is adapted from the author's forthcoming book: **Establish, Govern, and Renew the Enterprise Knowledge Practices**.

[3] We distinguish between "knowledge" and "information" and recognize that they are fundamentally different. **Information** consists of facts and other data organized to characterize a particular situation, condition, challenge, or opportunity. **Knowledge** consists of truths and beliefs, perspectives and concepts, judgments and expectations, methodologies and know-how and is possessed by humans, agents, or other active entities and is used to receive information and to recognize and identify; analyze, interpret, and evaluate; synthesize and decide; plan, implement, monitor, and adapt – i.e., to act more or less intelligently. In other words, knowledge is used to determine what a specific situation means and how to handle it.

The successful enterprise's objectives for pursuing KM are clear: It wishes to manage knowledge effectively to make people – and the whole enterprise – act intelligently to sustain its long-term viability by developing, cumulating, and deploying highly competitive knowledge assets in people and in other manifestations. They expect that intelligent-acting behavior will lead to proper and effortless handling of routine and simple tasks and that nonroutine, complex, and unexpected tasks will be handled timely, competently, and in the best interest of all concerned with suitable balances between long-term and short-term objectives. The belief is that consistent intelligent-acting behavior secures competitive leadership.

A BROAD PERSPECTIVE OF KNOWLEDGE MANAGEMENT

"As knowledge management is practiced by Lotus and our customers, we see it as a vital capability underlying virtually all management techniques, not a management technique itself. ... No one should have to 'plug away' at knowledge management, but rather instill it into all management techniques and processes."[1]

Our definition of KM is broad and embraces KM approaches and activities throughout the organization. From this view, undertaking KM is practical, basic, and far from faddish. KM is not only a technology, not only a set of explicit and rigidly systematic activities, or not only a patent method to increase the economic value of the enterprise. Instead, KM is a broad effort to make the enterprise "knowledge-vigilant." Systematic and explicit KM is designed to create an enterprise-wide, adaptive, contextual, comprehensive, and people-centric environment that promotes continual personal focus on knowledge-related matters. This should occur as part of the daily mix of activities and responsibilities to make everyone – alone, or in groups – act intelligently for their own and the enterprise's benefits and sustained viability.

Some aspects of enterprise-wide intelligent-acting behavior are indicated in Figure 2. The underlying premise is that ***"Knowledge is a fundamental factor behind all of the enterprise's activities."*** The model outlines elements that fall under the auspices of KM, such as learning and innovating and the effective creation and application of knowledge assets (KAs) in internal operations. It also points to the need for permission, motivations, opportunities, and capabilities for individuals to act intelligently.

KM is the systematic and explicit management of knowledge-related activities, practices, programs, and policies within the enterprise. Consequently, the enterprise's viability depends directly on:

- The *competitive quality* of its knowledge assets; and
- The *successful application* of these assets in all its business activities – i.e., realization of the knowledge assets' value.

From a slightly different perspective: "***The goal of Knowledge Management is to build and exploit intellectual capital effectively and gainfully***."[2] This goal is valid for the entire enterprise, for all of the enterprise's activities, and needs additional explanations since there is considerable complexity behind it.

One important aspect for effective KM is the requirement to deal explicitly with the complexity of how people use their minds – that is, think – to conduct work. It concerns what they need to know and understand and how they must possess and have access to knowledge to act intelligently in different situations. The same considerations must also be dealt with on the organizational level.

Two aspects of effective, broad-based KM must be emphasized. The first is that in the long run, KM initiatives and activities normally do not lead to more work. Instead, as a result of improved knowledge and knowledge use, often far down in the organization, operations experience less rework and hand-offs, quicker analysis, decision, and execution, particularly of nonroutine tasks, and many other desirable traits. The second aspect is that KM activities and initiatives, instead of being new

[1] From Letter to the Editor of Computerworld by Jeff Papows, CEO of Lotus Development Corp (1998).

[2] Fernando Simões, private communication (1998).

and added functions, must to the largest extent possible be based on, and be part of, ongoing efforts – often without making these more difficult, time consuming, or demanding.[1]

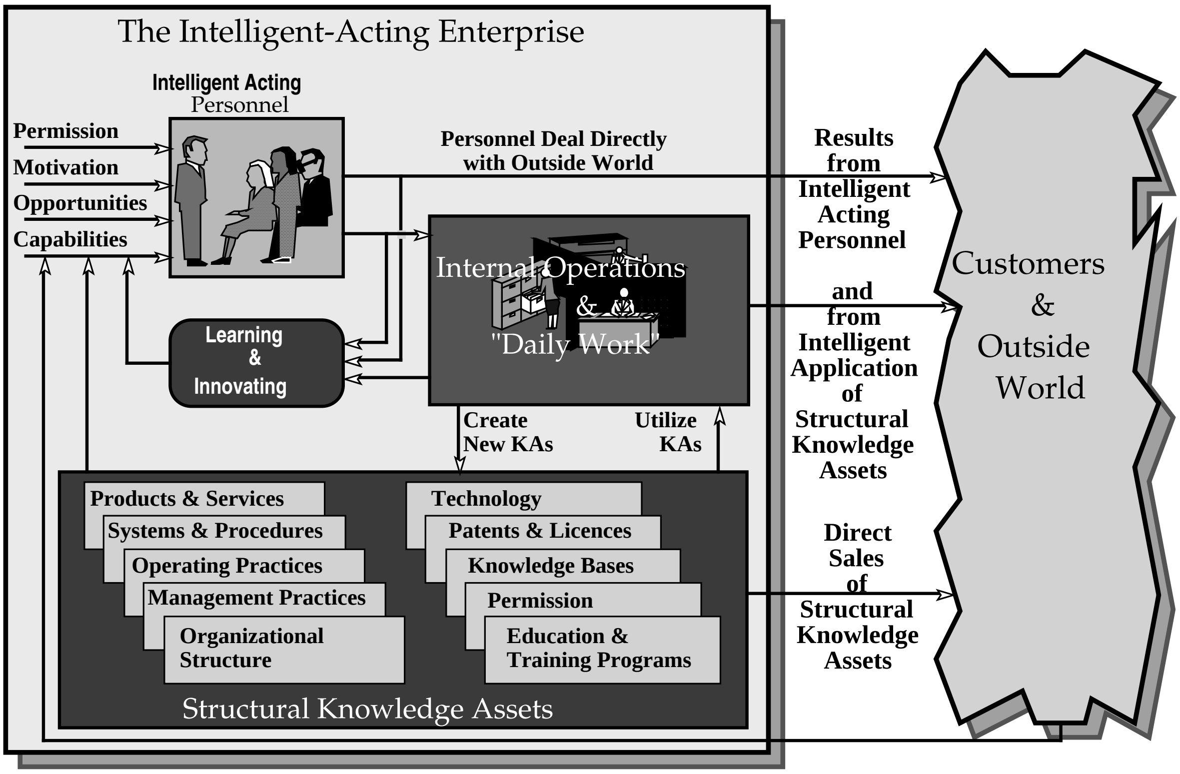

Figure 2. Role of Individuals, Knowledge Assets, Learning and Innovation, and Internal Operations for Enterprise-Wide Intelligent-Acting Behavior.

Building intellectual capital on the personal and enterprise levels takes place in hundreds of different ways. Building professional intellectual capital ranges from educating stock brokers in theories that explain principles behind market mechanisms to building enterprise knowledge assets by embedding outstanding engineering knowledge into new designs for automotive transmissions. Intellectual capital building in crafts people clearly can range from training employees in better methods for assembling electronic boards to educating them in principles for operating and maintaining their equipment.

Sharing knowledge, networking to become acquainted with what others know, or attending courses are examples of investment activities to build intellectual capital for future use. Knowledge required to work effectively only partially consist of the primary professional and craft knowledge that normally is the focus. "Enterprise navigation knowledge" – the understanding of whom to contact, and how to treat them in special situations and handle non-routine challenges – constitutes the major part of the typical employee's valuable knowledge. However, this personal knowledge is only "rented." It is not owned by the enterprise but is possessed by the individual.[2]

Building intellectual capital ***effectively*** requires that only the best available knowledge is incorporated in the resulting intellectual capital. Building intellectual capital ***gainfully*** refers to investing in, among others, expanding, verifying, and validating intellectual capital in cost effective ways where the comprehensive, life cycle returns exceed investments.

Whenever work is performed, and whenever goods, services, licenses, and the like are sold or exchanged for value, the value of intellectual capital is realized in some manner. We are particularly interested in how intellectual capital is applied to perform regular work – both routine tasks and unexpected challenges. Most work is perhaps "routine" and is often based on pre-established

1 Lucier and Torsilieri (1997)

2 Edvinsson and Malone (1997).

principles. Increasingly, work is becoming "project work" which demands individualized approaches and improvisation.

Exploiting intellectual capital ***effectively*** refers to using the most appropriate methods for transforming the requisite intellectual capital to the best form to realize its value and to place it at the Point-of-Action (PoA). Exploiting intellectual capital ***gainfully*** requires that the most appropriate knowledge assets (i.e., "best" knowledge) is used wherever work is performed and that it is used in the best interest of the enterprise and individuals. That is particularly important in high value-added situations, but ideally, should always be the case and can only be achieved in a knowledge-vigilant environment. It also requires that intellectual capital that are sold or licensed be leveraged to the highest extent possible without producing negative impact.

From operational perspectives, the tasks that need to be performed to pursue the tactical KM foci are different. Some examples of operational functions are indicated in Figure 3.

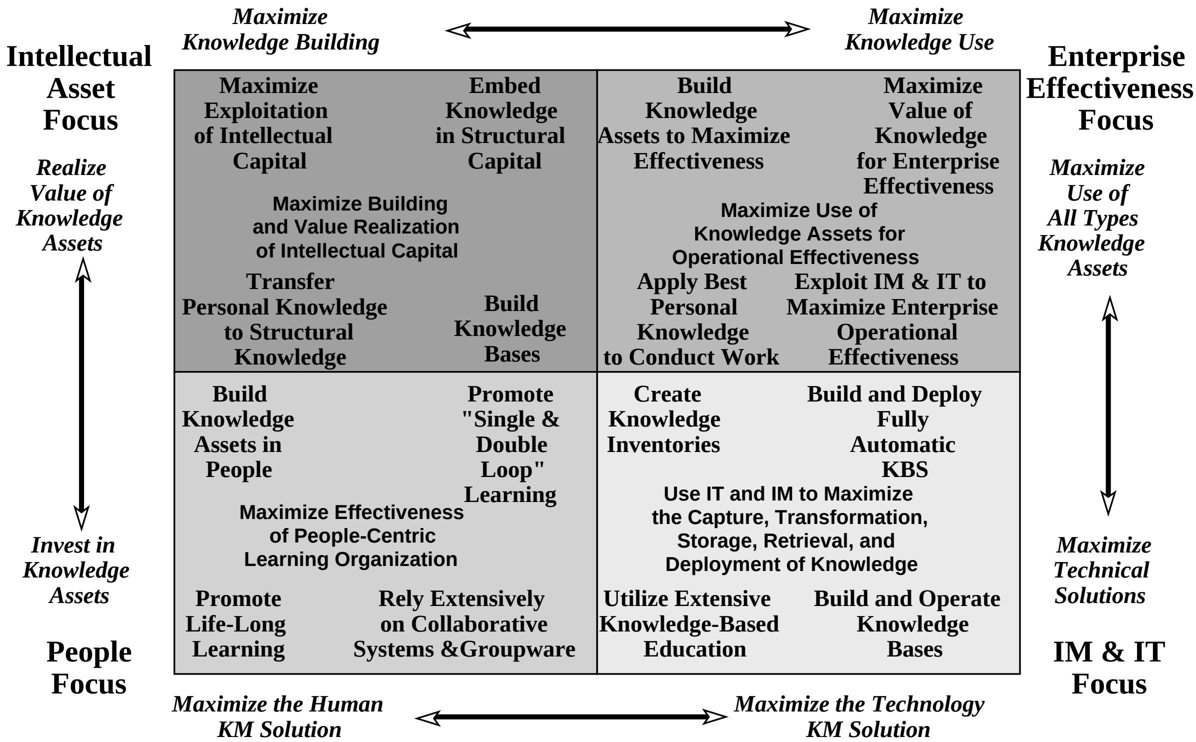

Figure 3. Examples of Operational Functions within the Four KM Focus Areas.

EIGHT IMPORTANT AGENDA ITEMS FOR THE KM PRACTICE

We can outline what must be pursued up-front for successful introduction of the enterprise KM practice. These suggestions are listed below in sequence of importance:

- Develop a **broad vision** of the KM practice and obtain **top management buy-in**:
  KM champions must have a deep and flexible mental outline of how KM will be conducted and organized to support the enterprise's direction – its goals and objectives. This vision provides the foundation and guide for creating KM capabilities and infrastructure supports and for setting priorities.

- Pursue **targeted KM focus** determined from knowledge landscape mapping insights and other opportunities and based on KM priorities that align with enterprise objectives:
  Undertake "bite-sized" and sharply targeted KM initiatives with clear benefit expectations that cumulatively build to implement the KM vision.

- Allow team members to **focus full time on KM** and build **KM Professional team**:

Designate highly competent KM team members to work dedicatedly on KM and avoid the mistake of diverting their efforts by giving them additional responsibilities. This is difficult.

The KM practitioners and team members must have good understanding of "knowledge" (in contrast to "information"); its role in conducting knowledge intensive work in diverse situations, methods for eliciting, acquiring, transferring, and organizing knowledge; etc. These are often new professional areas for the enterprise.

- Install and agree on **KM impact and benefit evaluation methods**:

  Impacts and benefits from KM are often indirect and happen gradually over time. Dynamic event chain and other impact assessment approaches must be selected and serve as approved foundations for cost-effectiveness or E.V.A. analyses that are acceptable for setting enterprise priorities.

- Implement **incentives** to manage knowledge on personal and enterprise levels, collaborate broadly, and act intelligently – innovate, capture, build, share, and use knowledge:

  The enterprise must express its support of KM clearly. Employees on all levels must understand personal benefits resulting from active KM. **Disincentives** must be removed.

- Teach **metaknowledge** to everyone:

  Knowledge workers at all levels exhibit sharp increases in their work focus, effectiveness, ability to develop and take advantage of improved knowledge – when taught with procedures that allow them to internalize metaknowledge (e.g., topic-, methodology-, and structure-related conceptual maps) for areas as disparate as situation handling (including problem solving and decision making), systems theory, dealing with interpersonal situations, and technical work topics.

- Select KM activities that will provide **opportunities, capabilities, motivations, and permissions** for individuals and the enterprise to act intelligently:

  To realize the full value of personal knowledge and other knowledge asset manifestations, the use of these assets for delivery of products and services must be highly effective. Effective intelligent-acting behavior can only be achieved when the conditions of opportunity, capability, motivation, and permission are satisfied.

- Create supporting **infrastructure**:

  Build upon all appropriate existing capabilities and gradually add new ones as required to facilitate effective KM, particularly in the chosen target areas.

A common problem for many KM teams is that they have not had the opportunity to acquire adequate understanding of KM theory and practical approaches. Practical knowledge management work requires focus and expertise at several levels: One level is to provide insights and details to set priorities and strategic direction; A second is to understand broad operational requirements to determine needs for infrastructure; A third is to work with knowledge-intensive functions to determine needs and opportunities; A fourth is to deal with knowledge itself – elicit, organize, encode, or build into KBS applications; among others. The associated work needs to be considered from different perspectives. They are the strategic, the tactical, and the operational. In particular, the KM management and operational team must include perspectives and expertise to deal with central KM issues such as:

- Providing insights to set priorities and strategic direction.
- Understanding broad, enterprise-wide requirements to determine needs for incentives, infrastructure, and other supports.
- Working with knowledge-intensive functions (i.e., how people – and organizations – obtain, create, hold, share, and apply knowledge) to determine needs and opportunities for .
- Dealing with knowledge itself – elicit, organize, encode, deploy personal and structural knowledge for direct use or to build it into intellectual capital such as products, services, technology, or KBS applications.

A TAXONOMY OF KNOWLEDGE MANAGEMENT BUILDING BLOCKS

Below we introduce examples of KM building blocks – potential KM activities – for introducing and sustaining the enterprise's KM practice. It is not the intent that building blocks be implemented rigorously but they reflect building of systematic, i.e., integrated and reasonably interconnected, activities that support each other in a functional manner. Again, care must be taken to allow improvisation to reflect the real context of people, work environments, management philosophies, and the needs of the enterprise, its customers, its suppliers, and other stakeholders.

A KM introduction effort may focus on a limited or a wide selection of building blocks and those can be pursued in parallel, iteratively, or periodically. Furthermore, other building block versions may be created to suit the situation. Approaches to introducing and sustaining KM will vary by constraints and necessity. Capabilities and management perspectives vary, needs are different, and as a result, detailed emphases and implementation solutions must be adapted to the situation.

The general relationships between the various KM building blocks are illustrated in Figure 4. Only major and clearly definable relationships have been labeled. Some broader relationships, such as those associated with the management functions have not been identified, nor have all their points of influence been shown. It is implied in Figure 4 that a KM introduction program will start with the first building block, "Obtain Management Buy-In," and that other activities proceed from there. That may not always be the case if sufficient insight already exists to allow the introduction effort to be targeted and focused on highly value-added efforts or when different perspectives for what the KM practice should achieve are pursued. Similarly, one or more of the building blocks may be omitted when there are sufficient insights to proceed to higher levels.

Together the building blocks form a coordinated and comprehensive KM practice. However, the intent is not for the beginning KM practice to pursue all building blocks, but to select those that form a suitable subset for the particular situation that the enterprise faces.

Major KM building blocks that may be considered for introducing a KM practice include the ones listed below.[1] They are presented in approximate order of implementation:

1. **Obtain management buy-in**: Pursue management commitment since it has proven essential for success of KM efforts. This stems from the central position that knowledge occupies in the enterprise.
2. **Survey and map the knowledge landscape**: Identify the nature, strengths, and weaknesses of the enterprise knowledge assets and situation in view of enterprise direction and operations and market pressures and opportunities.
3. **Plan the knowledge strategy**: Determine how KM will support the enterprise or business unit strategy and pencil out KM thrusts and expected priorities.
4. **Create and define knowledge-related alternatives and potential initiatives**: Identify opportunities for improvements such as opportunities for revenue enhancement, creation of new products and services, relief of knowledge-bottlenecks and other knowledge-related actions with the support of department and enterprise-level priority setting and outline their expected impacts and benefits.
5. **Portray benefit expectations for knowledge management initiatives**: Delineate expectations to prioritize, guide implementation, and monitor the effectiveness of KM efforts.
6. **Set knowledge management priorities**: Determine priorities for activities based on KM strategy, expectations for net benefits, needs, and availability of capabilities.
7. **Determine key knowledge requirements**: Identify knowledge required to deliver quality work in key or complex positions.
8. **Acquire key knowledge**: Capture knowledge from departing personnel and knowledge required for key critical knowledge functions (CKFs).
9. **Create integrated knowledge transfer programs**: Create comprehensive knowledge transfer programs – for example by coordinating training programs, creating expert networks, or

[1] Additional descriptions of KM building blocks can also be found in Liebowitz & Wilcox (in press).

communicating expert knowledge such as concept hierarchies and mental strategies to practitioners (content as subject knowledge and methodologies as metaknowledge).

10. **Transform, distribute, and apply knowledge assets**: Organize and transfer expert knowledge to practitioners. Reconfigure, deploy, and exploit knowledge through effective use of "best" knowledge in all daily work.

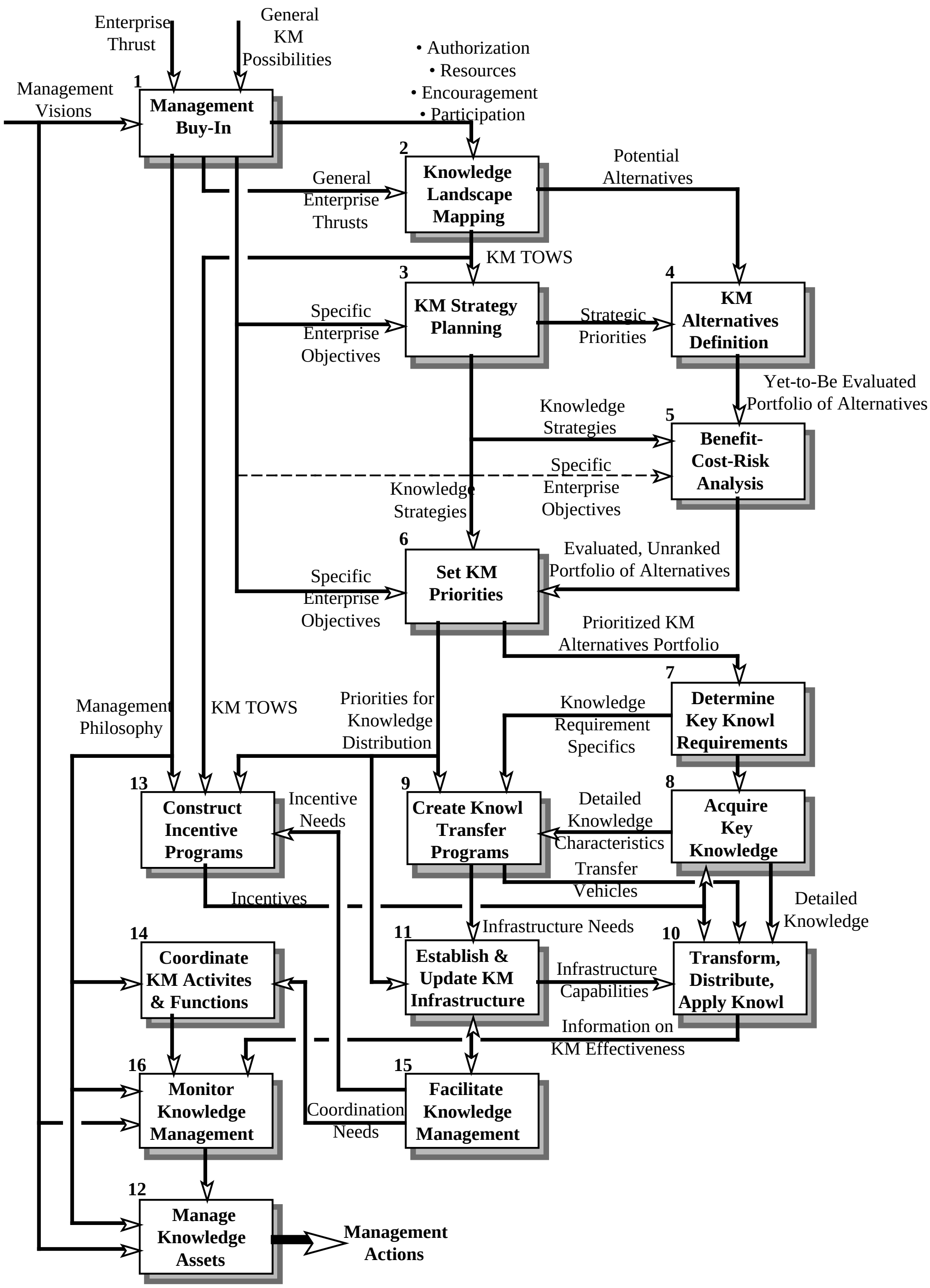

Figure 4. Illustrative Relationships Between KM Building Blocks.

11. **Establish and update KM infrastructure**: Build and maintain generic capabilities, some of which are specific to KM while most are shared with other activities and functions.

12. **Manage knowledge assets**: Create, renew, build, and organize knowledge assets to address priority knowledge opportunities.
13. **Construct incentive programs**: Motivate employees to act intelligently, i.e., be innovative, share knowledge, expend effort to capture knowledge (e.g., lessons-learned), ask for assistance when meeting unfamiliar or difficult situations, etc.
14. **Coordinate KM activities and functions enterprise-wide**: Identify KM-related activities and assist them to coordinate, cooperate, and collaborate to build valuable capabilities and practices.
15. **Facilitate knowledge-focused management**: Provide high level activities to change the enterprise "customer service paradigm," culture, work environment, management philosophy and practices, operating practices, decision rights, work flows and "opportunities to act intelligently," and personal motivators.
16. **Monitor knowledge management**: Provide feedback on progress and performance of KM program and activities.

A TYPICAL KNOWLEDGE MANAGEMENT INTRODUCTION PROGRAM

Introduction of KM into the enterprise must be shaped by the enterprise's thrust, capabilities, condition, and environment. It takes several years before a full-fledged KM practice has spread across even a medium-sized enterprise. Several aspects of KM introduction take time. Implementation of the complete range of incentives, with dismantling of disincentives and introduction, are slow processes which may take several years before agreements are established and procedures put in place. Creation of internal KM professional capabilities often involves finding and hiring additional people and allowing existing employees to pursue advanced degrees in the new fields.

In spite of the long planning horizon required for full KM practice implementation, a beginning KM program can be conceived and implemented within months, once the vision has been created, a target area has been selected, and the decision has been taken to allocate resources. Benefits will follow and, if the target area has rapid dynamics, should be observable soon thereafter.

Given descriptions of the KM building blocks and a perceived introduction horizon of less than one year, we can outline a potential introduction program for a general enterprise KM practice. It should be noted that this is an arbitrary illustration, not a specific recommendation. The example of a beginning KM introduction program illustrated in Figure 5 includes six major steps:

- Build management understanding and commitment to pursue KM.
- Map perspectives of the knowledge landscape.
- Plan the enterprise KM priorities, focus, and strategy.
- Identify sought KM benefits.
- Adjust KM priorities.
- Create KM-related incentive programs.

CONCLUDING REMARKS

A set of KM building blocks are presented, not as a recommended implementation program. Instead they are intended to provide a taxonomy for how explicit KM activities and tasks can be defined and relate to one another.

Effective KM is of vital importance for any enterprise that seek to ensure viability and survival. Accepting this premise, requires considerations for how the KM practice can best be introduced to result in maximum value. There are dilemmas in these considerations. On one side, it is desirable to introduce KM quickly to gain early bottom-line results by targeting the most promising opportunities and making available the most capable proficiency to ensure the best possible approaches and yields from the efforts. On the other side, it is desired that KM introduction should introduce minimum disturbances and distractions from daily work and other efforts, consume minimum resources, be able to utilize people who are not urgently needed elsewhere, and expose the enterprise to minimum risks. Most senior managers would also prefer that approaches to KM introduction would be sufficiently well understood to allow delegation of its implementation and management and thereby reducing the need for their own involvement and attention.

Given these competing objectives, it is not surprising that many KM efforts fall pray to the four common problems that Lucier and Torsilieri (1997) point to, all of which are correctable: (1) "No specific business objective," (2) "Incomplete program architecture," (3) Insufficient focus upon strategic objectives," and (4) "Top management sponsorship without active involvement."

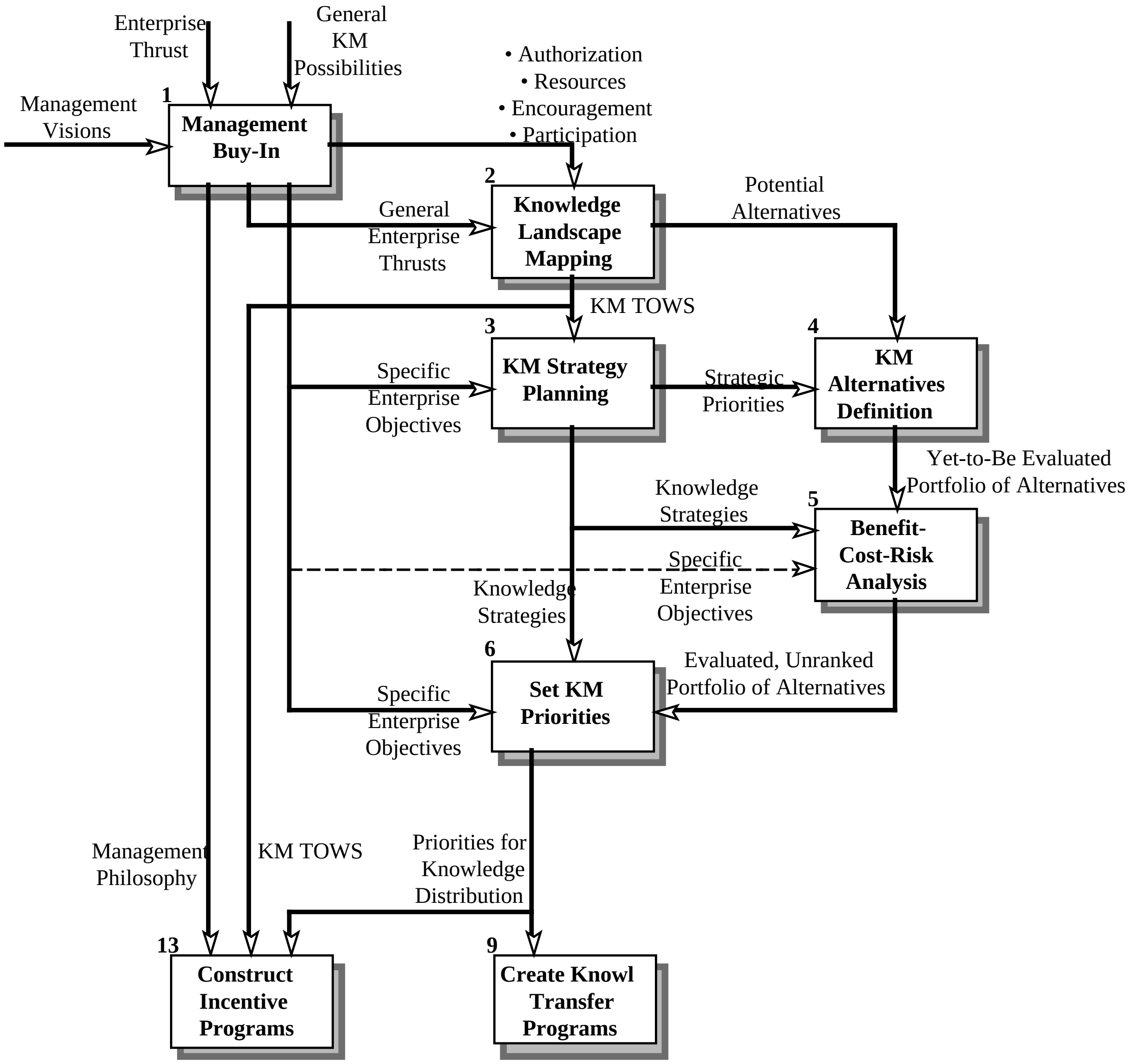

Figure 5. A Beginning Knowledge Management Introduction Program.

REFERENCES AND RELATED READING

American Psychological Society (1998). **APS Observer Special Issue: HCI Report 6 – Basic Research in Psychological Science: A Human Capital Initiative Report.** February 1998, Washington DC: APS

APQC/EFQM/KMN (1997). **Knowledge Management and the Learning Organization: Best-Practice Report**. Brussels: EFQM.

Edvinsson, Leif & Malone, Michael S. (1997). **Intellectual Capital: Realizing your company's true value by finding its hidden brainpower**. New York: Harper Business.

Fayyad, Usama; Piatetsky-Shapiro, Gregory; & Smyth, Padhraic (1996). "The KDD Process for Extracting Useful Knowledge from Volumes of Data." **Communications of the ACM**, **39** (11): 27-34.

Liebowitz, Jay & Wilcox, Lyle, editors (in press). **Handbook of Knowledge Management**. Miami, FL: CRC Press

Lucier, Charles E. & Torsilieri, Janet D. (1997). "Why Knowledge Programs Fail: A CEO's Guide to Managing Learning." **Strategy & Business**, Fourth Quarter 1997, (9): 14-28.

Papows, Jeff (1998) "Knowledge management may be vital to your strategy." **Computerworld**, August 10, 30.

Singley, Mark K., & Anderson, John R. (1989). **The Transfer of Cognitive Skill**. Cambridge, MA: Harvard University Press.

Spek, Rob van der & Spijkervet, André L. (1995). **Knowledge Management: Dealing Intelligently with Knowledge**. Utrecht, the Netherlands: Kenniscentrum CIBIT .

Stewart, T. A. (1997). **Intellectual Capital: The new wealth of organizations**. New York: Currency Doubleday

Wiig, Karl M. (1993). **Knowledge Management Foundations: Thinking about Thinking – How People and Organizations Create, Represent, and Use Knowledge**. Arlington, TX: Schema Press.

Wiig, Karl M. (1995). **Knowledge Management Methods: Practical Approaches to Managing Knowledge**, Arlington, TX: Schema Press.

Wiig, Karl M.; Duffy, Neil;[1] Viedge, Conrad; Cook, Jonathan; Radley, Robert; Jooste, Adriaan; Jackson, Carl; Harley, George; and Brooking, Annie. (1997). **Leveraging Knowledge for Business Performance**. Johannesburg, RSA: Wits Business School.

[1]