How It Started: Knowledge Management as an Academic Discipline

When I was in business, it bothered me that my company had not taken advantage of what it knew. We had people scattered throughout the United States, and few knew the company’s full potential. We chased new business opportunities, not really knowing what we had already developed and sold. We were always proposing new solutions, without taking advantage of those we had developed in the past. Moreover, how could we, when we did not know what they were?

I left industry and joined academia in 1998, having accepted a full-time faculty position at the George Washington University (GW). I was appointed as an associate professor of Systems Engineering in the Department of Engineering Management and Systems Engineering, School of Engineering and Applied Science. I chose to seek a position in this department because it was both multi- and interdisciplinary, reflecting the realities of the complex world one has to work in. One of the largest departments of its kind in any university, it included nine academic concentrations built on the premise that engineers eventually become managers and need the necessary management competencies to function in the modern world. On the other hand, it helped managers understand better the engineers who work in their domains, and thus provided some engineering skills to managers.

In addition to responsibilities for teaching systems engineering, I also inherited the oversight of courses in marketing of technology, technologic forecasting and management, law for engineers, artificial intelligence, and decision-support systems. These two latter courses got me interested in knowledge management (KM). When the chair of the department asked me if I wanted to delete these courses from the catalogue, I asked him to let me evaluate whether there was any interest and determine the state of these fields. As a result of that investigation, I was impressed with the quality and quantity of works in KM. Had I known about these when I was in industry, I could have used them to the profit of the company. I was surprised that KM was not part of a core curriculum in any degree program at GW.

So began my journey on creating an academic discipline for KM. In my new position, I had inherited several graduate and doctoral students and asked them to help me with KM research. This research revealed that many universities had some research
and elective courses on KM, but none at the time had a graduate program, especially at the doctoral level, dedicated to the field. Even at GW, we had several noted writers, but certainly no major thrust at examining all the aspects of KM and subjecting them to the rigors of scientific exploration.

In our early research, two things became clear to me: (a) knowledge was the prime currency in our national and global economy, and (b) knowledge directly provided value to the bottom line. We still lacked a common language to deal with it, and consequently, we borrowed some of the language of the information revolution. While the United States officially reached the information age in 1991, we have always been a knowledge-based economy. What that means is quite simple: Our economic well-being and competitive advantage are dependent on knowledge resources—our knowledge, experiences, education, training, professional networks, collaborative, and innovative skills. Other names and categories for these resources include knowledge assets, intellectual capital, human capital, structural capital, customer capital, and market capital. In sum, these knowledge assets are the prime factors and resources of production in a knowledge-based economy. In the words of Jack Welch, former chief executive officer of General Electric, “Intellectual capital is what it’s all about. Releasing the ideas of your people is what we’re trying to do, what we’ve got to do if we’re going to win.”

The facts described in the preceding paragraphs have spawned a new way of thinking about and managing these assets: KM, which was popularized around 1995 by many authors, practitioners, and advocates of intellectual technology (IT). Since that time, KM has been both a wild success and a wild failure. KM represented an evolution from the data and information eras to that of the knowledge economy, as depicted in Figure 1-1. The same figure shows how each era spawned their corresponding management disciplines and technologic elements.

Figure 1-1

Timelines leading to the knowledge age.

The Past, Present and Future

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<tr>
<th>MANAGEMENT CONCEPTS</th>
<th>SYSTEMS THINKING / APPROACH</th>
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<tr>
<td>Systems / Project Management</td>
<td>CMM</td>
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<td>DATA PROCESSING SYSTEM (DPS)</td>
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<td>KNOWLEDGE MANAGEMENT SYSTEM (KMS)</td>
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<td>TECHNOLOGY ELEMENTS</td>
<td>DATA</td>
<td>INFORMATION</td>
<td>ARTIFICIAL INTELLIGENCE</td>
<td>KNOWLEDGE</td>
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<td>AGE</td>
<td>INDUSTRIAL</td>
<td>TECHNOLOGY</td>
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Many organizations such as BP/Amoco, Ford, Xerox, Cemex, Siemens, and Cisco have mastered the practices of KM and have shown how they contribute to the bottom line. However, many others have abandoned it, because it did not deliver on the promises, or worse yet, because they see no relevancy for it in their strategies and operations. To many, KM is a fad, not to be bothered with. Many studies have looked at KM and found numerous obstacles to its success, yet none have looked at them in the light of prime resources for the organization.

Why Knowledge Management? It Is All About Knowledge Management!

Which led me to the conclusion that KM has significance and that it must be elevated to its own academic discipline, with the accompanying theoretical constructs, guiding principles, and professional society to serve as an evolutionary thrust. KM certainly is not a fad, because the knowledge-based economy is here to stay. In addition, fads normally hang around for 5 years, and KM has been in existence for at least 10 years. If the current language and practices of KM are not the right ones, then we must find them: Our knowledge-based economy leaves us no choice. Knowledge assets are the tools with which today’s industries need to function. Consequently, KM must be given a priority position in our educational and training systems. It must be relegated to its own academic discipline, with guiding principles based on scientific research. We cannot afford the hit and miss of anecdotes and so-called best practices, even so called when they led to failure. Besides, it is not best practices that will give you the competitive advantage; rather, best practices-to-be.

So, what is an academic discipline? Webster defines it as a “field of study.” Fields of study are what universities create on the basis of their importance to society. Only a university can legitimize an academic discipline. If KM were to be given such a status, it had to go mainstream, which meant, in university terms, that it had to be a degree-granting program. Without that, no one would be seriously attracted to it. While many individuals come to a university to learn, their principle objective is to get a degree. A degree is the calling card in our world and the first requirement for acceptance and advancement in the workforce. The challenge, however, was on what theoretical construct could I base KM. There were no KM degree-granting programs in America at that time—perhaps none in the world—as determined by our limited research at that time. I had to find some basis to present a proposal to the faculty and university. The sell would have been easier at GW if I could have identified other universities with KM degree-granting programs. Such programs would have also provided some basis for a proposed curriculum.

Theories are developed from top down or bottom up. The latter method was chosen because of the numerous writings and practices already in existence. The bottom-up method was used by Sir Isaac Newton in developing his theories for motion and physics that accelerated the industrial age: collecting falling apples and developing theories (i.e., validating, by scientific method, relationships among them). He often said that he could see further because he stood on the shoulders of giants. KM had such giants in Peter Drucker, Karl Wiig, Ikujiro Nonaka, Larry Prusack, Tom Davenport, Tom Stewart, Hubert St. Onge, and Karl-Eric Sveiby, to name just a few. I asked one of my doctoral students, now Dr. Francesco Calabrese, to help me in looking at not only their works, but also as many works and practices that we could find. We relied heavily on the KM research by Gartner et al. We benefited by the KM summary work of Charles Despres and Daniele Chauvel [1]. What emerged from this research was
an initial collection of the “KM apples” in existence—over 40 at that time, as shown in Figure 1-2. We also examined some of the barriers to KM success (Figure 1-3), and focused in on the research done by KPMG, which seemed to capture and summarize all the other efforts at examining this aspect. Our goals were to identify the key apples or ingredients necessary for a KM system and to ensure we designed into the equation the prescription to overcome the barriers to KM success.

The Four Pillars: The DNA of Knowledge Management

There were many statements gleamed from the KM works and writings, including a proliferation of definitions that sometimes disagreed with each other. Many attempts dealt with the definition of knowledge itself, a kind of epistemologic approach. These latter attempts never addressed the issue of managing these knowledge assets; they merely discussed the question of the definition. Other works dealt with learning and all its facets. Although I had some interest in these aspects, my main issue was to determine the critical elements, a DNA if you will, of KM. To me, the operative work in KM was the management of these assets. The company already had these assets; it just did not know how to articulate them and, consequently, had little to no guidance on how to manage them.

There were many formulations also, such as KM is all about people, and not technology. Communities of Practice were the main application for this group. For others, it was all about technology, such as a “portals and yellow pages” of knowledge workers. Some said it was about people, technology, and process. Everyone had his or her favorite silver bullet or saying/taxonomy.
In laying out all the so-called models, elements, definitions, pronouncements, cautions, and approaches, it became apparent that there were four principle areas or groupings, each containing many elements. The challenge was to find names for these four groupings and to validate them through some scientific approach. The clock was also ticking on my going before the faulty to introduce the proposal for KM as its own concentration in our master’s and doctoral programs. I decided to take a stab at it, and the four pillars were born: All the KM elements were grouped under the following: Leadership/Management, Organization, Technology, and Learning (Figure 1-4).

Names and groupings could change later on, on the basis of further research. The challenge now was to make deadlines to get a KM program in the academic calendar, if even that was possible given the necessary layers of approval and the many people involved (department, school, and university) to implement a graduate-level course of studies.

The Four Pillars
- Leadership/management: Deals with the environmental, strategic, and enterprise-level decision-making processes involving the values, objectives, knowledge requirements, knowledge sources, prioritization, and resource allocation of the organization’s knowledge assets. It stresses the need for integrative management principles and techniques, primarily based on systems thinking and approaches.
- Organization: Deals with the operational aspects of knowledge assets, including functions, processes, formal and informal organizational structures, control
measures and metrics, process improvement, and business process reengineering. Underlying this pillar are system engineering principles and techniques to ensure a flow down, tracking, and optimum utilization of all the organization’s knowledge assets.

- Learning: Deals with organizational behavioral aspects and social engineering. The learning pillar focuses on the principles and practices to ensure that individuals collaborate and share knowledge to the maximum. Emphasis is given to identifying and applying the attributes necessary for a “learning organization.”
- Technology: Deals with the various information technologies peculiar to supporting and/or enabling KM strategies and operations. One taxonomy used relates to technologies that support the collaboration and codification KM strategies and functions.

Knowledge Management Curriculum

The curriculum proposed was based on the four pillars, each having its own course, bordered with introductory and capstone courses (Figure 1-5). The curriculum was based on a simple definition for KM and emphasized KM’s management/operational aspects: leveraging relevant knowledge assets to improve organization performance, with emphasis on improving efficiency, effectiveness, and innovation. If KM did not deliver, then we needed to discover why, and fix it.

I was able to recruit a world-class part-time faculty, who had experience in KM programs; extensive business, nonprofit, and government experience; and teaching expertise. Collectively, they helped design the courses and ensured not only quality
teaching, but also relevant applications. Our goal was to create and bridge theory with the practice.

Because of their quality work, the proposal was endorsed at all levels of the university. GW had a new master’s and doctoral program, which included a graduate certificate program (based on 18 graduate credits or half a master’s degree). We had a program and faculty. Now the challenge began: Would students come? I needed not only master’s level, but also doctoral applicants, for they were the basis on which KM research would validate the current curriculum and advance KM as a global academic discipline. Another question: Would other universities follow suit and create KM as a degree-granting area of study? If many students came, there would be competitive pressure to do so.

Knowledge Management: Research Map

The rest is history—many came. We were signing up classes in numbers of 20 and 30 each semester. These people were mostly working professionals, who brought a high degree of interaction with the faculty, as well as much needed feedback for course improvements. Other universities now have KM as a degree-granting program; there is even a consortium of KM doctoral candidates in Canada.

More important, I had doctoral applicants from all over the world. Although the average faculty had a handful of doctoral researchers, I knew I had to collect as many as possible, because we were at the beginning of a new area of research. Numbers became important: There is a certain quality to quantity. However, I needed people who not only had work experience in all sectors of the economy, but who also represented the many areas that make up the four pillars.
I also felt the importance of creating an institution that would create a community of KM enthusiasts dedicated to the field of KM. This institute would be based at GW, but would include interested people and groups from around the world; thus, it had to be global to succeed. It would have at its principal mission the bridging of KM theory and practice and advancing KM as an academic discipline, thereby augmenting the educational and research work for KM at GW. My colleague at the School of Business and Public Management, Dr. William Halal, a noted expert in forecasting and KM, cofounded and codirects the Institute with me. His leadership, vision, and energy made it all possible. This year, the School of Education and Human Development is also joining as a full partner. The Institute, formerly named the Institute for Knowledge Management, and recently renamed the Institute for Knowledge and Innovation (IKI) [www.gwu.edu/~iki], has attracted many prominent individuals and organizations: businesses, governmental agencies, academic institutions, professional groups and multinational organizations—all dedicated to the advancement of KM as an academic discipline. They serve as a brain trust for all members of the Institute as well as to the community at large.

It was truly necessary then to create a research framework upon which we could not only base decisions for choosing the doctoral students, but also oversee the many participants wanting to do work at the Institute. Dr. Art Murray, a long-standing expert in KM, part of the adjunct faculty in KM, and managing director of the Institute, created a KM research conceptual framework, which is based on the four-pillar construct and incorporates the various functions of KM: knowledge assurance, knowledge capture, knowledge retention, knowledge transfer, and knowledge utilization (Figure 1-6). As shown in Figure 1-7, each function was further divided into various categories.

**Figure 1-6**

Top-level conceptual framework for knowledge management.

- Learning
- Technology
- Organization
- Leadership
- Knowledge Use
- Knowledge Transfer
- Knowledge Codification
- Knowledge Generation
- Knowledge Assurance
Thus, having an initial basis for selection, we added one more selection criteria: To choose as many diverse people from around the globe, thereby ensuring we addressed regional cultural aspects. Now that we had a framework, again the question: Would students come? Come they did, from Korea, Taiwan, India, Africa, the Middle East, Mexico, Europe, and America. So many in fact that we had to start turning down many applicants. Currently, we are capped at 35 doctoral students from around the world, all with various work experiences and academic backgrounds, collaborating and using the research conceptual framework as a placement guide. We continually receive more applicants, but must delay them until further resources are available to guide their progress through the rigors of the dissertation. Fortunately, we have the generous support of the part-time faculty and other faculty members of IKI. Monthly meetings during the academic year facilitate research discussions and progress. Seminars and conferences also keep the group current, as well as challenged. They not only test their own hypotheses, but also collect resources for validation. We have KM technologies in place, thanks to the generous support of leading KM technology vendors, to maintain virtual collaboration and administration. We also use the KM technology laboratory as an educational tool.

Some Results: Laying a Foundation for An Academic Discipline

What follows, in the subsequent Chapters, are the results of 11 doctoral dissertations, dating from May 2000 to May 2004. Table 1-1 is a matrix of the writings, indicating their major objective and findings. They cover a range of KM areas, addressing frameworks, culture, technology, organizational value/metrics, and knowledge asset valuation. While dissertations are not the ultimate word, they must pass scholarly tests of research and examination, contributing to a body of knowledge. They are based on extensive literature reviews, research questions, and issues deemed significant. Their purpose is to define and enhance a body of knowledge.
The research described in this section is about creating the building blocks for the design and implementation of KM. Some may call these frameworks or models. In any event, these are some of the building codes and principles knowledge architects need for laying out the design for a knowledge management system (KMS) (Note: “System” throughout this book is used in the larger sense and does not represent an IT system.)

There are no single point solutions in KM, and while each chapter may look at only one aspect, it is important to regard each as a piece of a large, complex puzzle. I often use the analogy of the four pillars to that of the juggler. The juggler has four balls in the air and loses when he or she drops any one of them. While one may be higher than the others, they must all continuously stay in play. Management may focus more attention on any one at a particular moment, due to the demands of the moment or the stage in their life cycle, but they cannot drop any of the others. They may only be in their peripheral vision, but they still must be watched.

Each chapter attempts to not only codify their findings, but also may include some additional insights by each author, based on their own experiences. Each author offers “golden nuggets” (italicized after each dissertation summary), which could be regarded as guiding principles for KM practitioners. While these are not the end game for KM (for one dissertation does not make a body of knowledge), they certainly represent solid advances for KM as an academic discipline. It is our intent to replicate these

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<tr>
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<th>Guiding Thought</th>
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<td>Key elements for a KM initiative</td>
<td>Integration and balance</td>
</tr>
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<td>Dr. Charles Bixler</td>
<td>Conditions and drivers for KM success</td>
<td>Upfront recognition</td>
</tr>
<tr>
<td>Dr. Juan Roman-Velazquez</td>
<td>KM in government and nonprofit sectors</td>
<td>Streamline</td>
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<td>Dr. Vincent Ribiere</td>
<td>Interpersonal trust in KM</td>
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<td>Drs. Po-Jeng Wang and William Schulte</td>
<td>National culture impact on KM</td>
<td>National culture has impact</td>
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<td>Dr. Juan Pablo Giraldo</td>
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<td>Support knowledge flows and context</td>
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<tr>
<td>Dr. Kevin O’Sullivan</td>
<td>KM technologies support to intellectual capital management</td>
<td>Organization size is important factor</td>
</tr>
<tr>
<td>Dr. Heejun Park</td>
<td>KM technologies and organizational culture</td>
<td>Promote product and people orientation</td>
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<tr>
<td>Drs. Mickey Ross and William Schulte</td>
<td>KM in industrial-military organization</td>
<td>Agree on strategic objectives</td>
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<tr>
<td>Dr. Vittal Anatatmula</td>
<td>Criteria for KM success</td>
<td>Need hard and soft metrics</td>
</tr>
<tr>
<td>Dr. Annie Green</td>
<td>Framework for KM valuation</td>
<td>Knowledge assets are strategic</td>
</tr>
</tbody>
</table>

Table 1-1

Matrix of Doctoral Research and Findings

The research described in this section is about creating the building blocks for the design and implementation of KM. Some may call these frameworks or models. In any event, these are some of the building codes and principles knowledge architects need for laying out the design for a knowledge management system (KMS) (Note: “System” throughout this book is used in the larger sense and does not represent an IT system.)
dissertations with new participants and to explore other ones to meet the growing
demands and needs of the community. The chapters are grouped under the following:
Frameworks, Learning/Culture, Technology/Environment, and Organization
Metrics/Valuation. (This grouping is solely the editor’s choice, and recognizes that
there is an overlap with other areas of study.)

Frameworks

This section treats the necessary foundational building blocks in designing and
implementing a successful KMS.

Dr. Francesco A. Calabrese (fcalab@gwu.edu) validated the four-pillar framework,
suggesting key elements defining effective enterprise KM programs. His research is
based primarily on reviewing and synthesizing the scholarly works and published
practices of KM up to the year 2000. The results were validated from questionnaires
to more than 240 industry and government personnel participating in KM programs.
He and Dr. Arthur J. Murray then collaborated in creating an artifact of guidelines for
applying KM principles to achieving improved business performance in the students’
organizations.

(KM requires the integration and balancing of leadership, organization, learning,
and technology in an enterprise-wide setting.)

Dr. Charlie Bixler (bixlerc@utanet.com) examined the drivers for, and value deliv-
ered from, KM to an enterprise. He indicates what are the requirements and condi-
tions for success, as well as ranking the benefits and expectations of this system. His
research surveyed more than 100 enterprise managers. The results are expected to
serve as a foundation for developing a KM capability maturity model, which can be
used to assess the design and implementation of a KMS.

(KM must not only recognize requirements and conditions for success, but also
support the desired benefits and expectations of the enterprise.)

Learning/Culture

This section describes various aspects of how an organization addresses the dynam-
ics of social relationships. Topics addressed include the impact of culture, both orga-
nizationally and geographically, on KMS; trust as a key ingredient for sharing
knowledge; differences in the approach of government, nonprofit, and profit organi-
zations to KM; and the impact of national culture on KM implementation.

Dr. Juan Roman-Velazquez (juan.roman@nasa.gov) examined the enterprise cul-
ture in government and nonprofit sectors vis-à-vis their strategic approaches for
knowledge flows at the different hierarchical levels. Using a four-culture—type taxon-
omy, he questioned more than 340 employees. He concluded that government and
nonprofit organizations that implement KM in a “hierarchical” culture had the
lowest chance of success.

(Streamlined organizational structure with strong cultures has a higher chance of
KM success.)

Dr. Vincent Ribiere (vince@vincentribiere.com) examined the impact of interper-
sonal trust on knowledge-centered organizational culture. In 100 organizations, he
explored the relationships between interpersonal trust and the likelihood of success of
a KM initiative, the level of involvement/participation in communities of practice, and
finally, the choice of the primary source of problem-solving information.
(An atmosphere/culture of trust is necessary to sharing knowledge.)

Drs. Po-Jeng Wang and William Schulte (wschulte@su.edu) examined the impact that national culture has on implementing a KM system. They used a highly regarded national cultural model as a baseline and studied the dynamic nation of Taiwan, which has a knowledge-based economy. They had access to more than 800 people and concluded that national culture plays a significant role in KM implementation.

(National culture affects the values and practices of every organization in KM implementation, especially at the lower levels.)

Technology/Environment

This section discusses what KM technologies are appropriate for a particular KM system and environment and complex social systems and their impact on technology choices. The section also describes several taxonomies and frameworks of these technologies and provides design criteria when making buy-decisions.

Dr. Juan Pablo Giraldo (giraldo@us.ibm.com) examined the relationship between KM technologies and the learning actions of global organizations. He developed a framework that balances technologies, flow of knowledge, context of knowledge, and critical actions that support technology investments. After examining more than 60 people from 21 organizations, he concluded that KM technologies improve organizational learning, especially when learning actions are adapted to their environment.

(KM technologies contribute to organizational growth only if the flow and context of knowledge are supported.)

Dr. Kevin O'Sullivan (kosulliv@nyit.edu) examined the extent to which KM technologies are used to manage intellectual capital. He grouped these KM technologies into eight major categories. He studied 145 organizations of different sizes, dispersed around the globe, and operating in different industry sectors. He concluded that the size of an organization is a factor in determining which technology is best suited for managing intellectual capital.

(KM technologies are useful in managing and leveraging intellectual capital, but the size of the organization is a major variant.)

Dr. Heejun Park (hjpark@ssu.ac.kr) examined KM technologies from an organizational cultural impact focus. He developed a typology for KM technologies and used it to ascertain the ideal organizational structure for each KM technology. He concluded that cultural issues have a direct impact on technology selection and thus must be taken into account. Specifically, he noted that organizations most successful in KM technology implementation have identified an organizational culture that embodies a mixture of both product and people orientation.

(Successful KM technology implementation requires an organizational cultural that promotes a blend of product and people orientation.)

Drs. Mickey Ross and William Schulte (rossmv@supship.navy.mil) examined an industrial-type military organization, comprising military, civil service, and contractor personnel. Their objective was to determine which among several factors, such as culture, processes, organization, and technology, were the more important for successful KM initiatives. Their findings indicated that technology was the least important, and viewed primarily as an enabler.
Organizational Metrics/Valuation

This section analyzes the impact of organizational functions, processes, controls, metrics, and organizational structures on KM. One of the main issues highlighted is the difficulty, but necessity, of valuing and leveraging knowledge assets. There are suggestions on taxonomies and methods for describing, measuring, and valuing these assets.

Dr. Vittal Anantatmula (vsa@gwu.edu) examines the establishment of criteria for measuring the success or failure of KM efforts in government, nonprofit, and for-profit organizations. Results from more than 153 responses, and a list of 26 criteria, show that improving communications is a common criterion for both government and nonprofit organizations, while enhanced collaboration is common for both for-profit and nonprofit organizations. Businesslike metrics were not high on any favored-criteria list. The research revealed that most KM efforts result in soft measures, which are not directly tied to end results.

(KM criteria for success should include both soft and hard measures if top leadership is to support KM initiatives.)

Dr. Annie Green (annie.green@att.net) proposes a framework that represents a dynamic relationship between strategic objectives of KM and the value drivers of intangible assets. She lists a common set of business dimensions, which support measurement and performance indicators of knowledge assets.

(Knowledge assets are strategic, and must be accounted for and valued accordingly.)

Summary

In summary, we have the results of 11 research efforts that address various aspects of KM, all with the intention of adding to the KM body of knowledge. These efforts examined correlations between and among key factors and perhaps more important, tried to verify cause and effect where possible. What makes a KM initiative successful? What are the strategic and operational things one must do? How do you value knowledge assets? What role does culture, both national and organizational, play? Their intent is to provide the theoretical construct for KM applications—bridging practice with theory. Without a sound theory, the best practices, and best practices-to-be, tread on weak grounds. Our goal is to build a body of knowledge and an accompanying academic discipline, with attendant guiding principles and theorems. The following golden nuggets, derived from their research, are only the beginning of this quest:

- **KM requires the integration and balancing of leadership, organization, learning and technology in an enterprise-wide setting.**
- **KM must not only recognize requirements and conditions for success, but also support the desired benefits and expectations of the enterprise.**
- **Streamlined organizational structure, with strong cultures, have a higher chance of KM success.**
- **An atmosphere/culture of trust is necessary to sharing knowledge.**
• National culture affects the values and practices of every organization in Knowledge Management implementation, especially at the lower levels.
• KM technologies contribute to organizational growth only if the flow and context of knowledge are supported.
• KM technologies are useful in managing and leveraging intellectual capital, but the size of the organization is a major variant.
• Successful KM technology implementation requires an organizational culture that promotes a blend of product and people orientation.
• KM success factors are dominated by management ones, such as culture, process, and organization, with technology as the least important.
• KM criteria for success should include both soft and hard measures if top leadership is to support KM initiatives.
• Knowledge assets are strategic, and must be accounted for and valued accordingly.