



A Knowledge Perspective: The E/KM Product and Service Domain

Executive Summary

The value of enterprise knowledge management (E/KM), as both a management philosophy and a technology phenomenon, has now been recognized. But the value proposition associated with E/KM will be realized gradually over time. Its financial impact will result in both cost savings and revenue expansion within organizations of any size, in any industry—especially within the Global 2000. Organizations cannot afford to ignore this important opportunity, but E/KM adoption is in its early stages and large-scale mature initiatives are rare. The message is clear, however. Organizations that have been slow to act should wait no longer. Waiting, in the interest of reducing related technical or business risk, may result in a sustained competitive disadvantage!

In this Report, the Yankee Group identifies six primary areas (see Exhibit 1) where knowledge-centric products and services are represented. We look at E/KM adoption across industries and discuss best-of-breed user cases. Consultants and systems integration (SI) firms, in our view, have leading roles to play in the implementation of E/KM initiatives. While the market for SI initiatives in this domain is currently small, post-2000 growth will accelerate. Finally, in our opinion, programs that ignore cultural factors and reward systems will fail. We offer some thoughts and examples to make our case.

Exhibit 1 The E/KM Product and Service Domain

Source: the Yankee Group, 1999

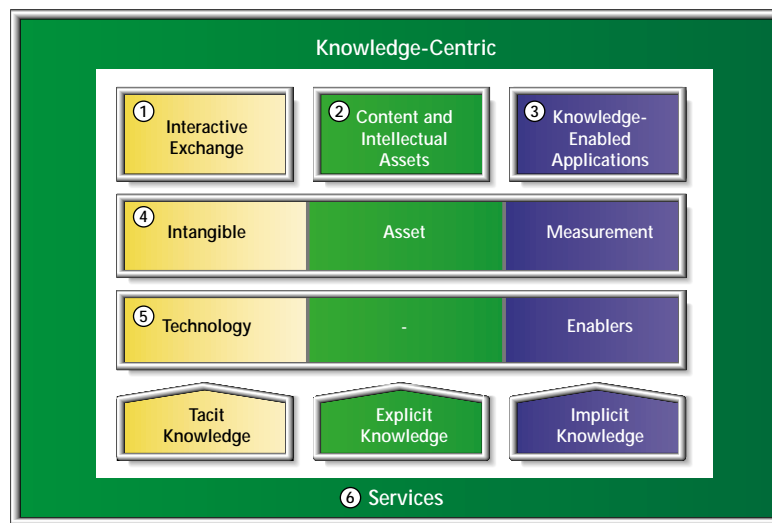


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I. Introduction

What happens when a previously unattainable level of enterprise knowledge is finally within reach, and its value clearly exceeds its cost? Factor into that a host of competitors that continue to base today's decisions on yesterday's assumptions. This dynamic exists today in virtually every industry. However, a surprising number of organizations either seem unaware of this shift, or minimize its potential impact. Extraordinary opportunities exist for those who more effectively leverage enterprise knowledge. But as this unusual set of circumstances plays out, opportunities will disappear. What was once considered a best practice, will quickly become the norm. And many of today's industry leaders will yield to a new generation of smarter, more efficient rivals.

Managers can no longer assume that competition is the same old bank, communications firm, insurance company, department store, or publisher. And there's no simple

explanation for what's driving this shift. A broad combination of business and technology factors is responsible. Business drivers include the continued deregulation and opening of global markets, industry convergence, increased levels of competition, and aggressive rivals consuming the less prepared. These shifts occur at a time of an equally dramatic transformation in technological capabilities. The Web has proliferated to a point where E-commerce is within the reach of virtually every business and consumer in the developed world. There have been rapid advances in technology infrastructure, hardware pricing continues to fall, suddenly a virtually limitless supply of inexpensive high-value content exists, and people, as well as the applications they use, are able to more efficiently share what is known throughout the enterprise.

The result is an unprecedented marketplace shift. This emerging environment abounds with opportunities and challenges that may be unfamiliar to the savviest managers. Nonetheless, issues must be carefully considered and creatively addressed, even more quickly than before. Enterprise knowledge management presents an opportunity to do just that. This Report offers perspective to users on related initiatives, and revisits some of the earlier concepts in the abstract to set the stage for detailed definitions and a discussion of our E/KM product and service framework. We consider what vendors are offering to serve this business challenge. An industry perspective is presented, followed by some best-of-breed user initiatives and our observations on risks and benefits.

II. Yankee Group Recommendations

The last 10 to 15 years have seen a significant change in the way that organizations operate in terms of staffing. Numerous management initiatives like downsizing, early retirement programs, and outsourcing have virtually eliminated the prospect of working for the same organization for one's entire career. In fact, most employees consider a five-year period a long tour of duty with any one firm. There is now a much higher churn rate of staff in almost all organizations. Some colleges now advise graduates to expect to work for eight different employers in their career. This poses a new problem for senior management: how do you retain and transfer key business-related knowledge to preserve continuity and foster growth of key business functions? One solution is to implement the latest "hot" business initiative—KM. But how does a Global 2000 executive effectively explore E/KM alternatives when there are few mature (and even fewer large-scale) examples to reference? Here are some suggestions to help address this important challenge:

1. Keep in mind that the concepts at the core of knowledge management are not new. What is new is the dynamic that has been created by decades of advances in technology-centric products and services. The business case for E/KM has suddenly become more compelling. This is true because the cost of leveraging organizational knowledge is now much lower than the value that can be derived from doing so.
2. Determine whether you want to implement new E/KM initiatives using a comprehensive, company-wide approach (for example, to deal with employee churn rates across multiple functions, when staff knowledge is central to the organization's mission), or a more selective approach. We recommend the latter for pilot projects, and the former once proof-of-concept has been achieved.

3. Who pays for the prototypes? We recommend leveraging the CIO's advanced technology budget or going up to management or the line-of-business general manager for special funding to start pilot projects. A large Yankee Group client in financial services funds early advanced technology projects from its IT budget, but operating groups fund the rollout. The CIO is responsible for platforms, standards, centralized purchasing, some deployment, IT operations, and centralized support. The division(s) facing the most "pain" and that stand to gain the most from a new technology implementation funds its rollout. The most understated aspects of the CIO's role have to do with early championing, evangelizing, and negotiating. The CEO, in this case, is keen on deploying new technologies as a basis for competitive advantage.
4. Seek outside consulting help in developing your E/KM strategy. The Yankee Group can offer perspective on firms offering services in this space.
5. Learn by example from actual case studies of organizations that have implemented successful initiatives, many of which are described in this and earlier Reports. Seek out the people that have implemented E/KM and talk to them about what has worked and what has not. You will find a small evangelical group that is eager to share experiences.
6. Technology leverage holds the key. Many of the underlying tools that enable E/KM are familiar to the organization. Some high-impact technologies include data warehousing and mining, document management, workflow, process modeling, multimedia, simulation, messaging, groupware, artificial intelligence, neural networking, fuzzy logic, statistical analysis, visualization, and Web-based technologies. Build upon related technologies and experience to ensure a fast start, a robust infrastructure, rapid implementation, and early success.
7. Understand that returns on investment (ROI) for associated programs do not always come in the form of easily quantifiable financial results. Expect traditional ROI to be combined with less tangible outcomes, such as lower employee turnover, better customer retention, and faster order fulfillment. Results should always be measured, recorded, and reported, with both strategic objectives and operating results in mind. One example that we profile later in the Report is a large multinational outsourcing firm that has been able to attribute increases in both sales and customer satisfaction to its E/KM investments.
8. E/KM initiatives often focus on necessary changes to organizational culture and management approach. Enterprise-level projects address the requirements of the entire organization, and not just that of individual functional silos. Therefore, there are some key questions to ask, as a major systems integration firm did recently: "How do I reward an application expert in Europe to share knowledge with colleagues in Japan, when both are servicing the same global account?" The answer, of course, lies in combining technology-based solutions with appropriate behavior-inducing rewards, which we will discuss later in this Report.
9. Finally, and perhaps most importantly, there is no action like action itself. Pilot projects that show promise or have become successful, must be quickly rolled out to the entire enterprise.

III. E/KM Circa 1999

E/KM is the art of transforming enterprise knowledge into business value. But is it real? We think so.

Our initial premise is that in order to effectively leverage enterprise knowledge, managers must first identify its many sources. Once identified, this knowledge must be stored, made “actionable,” distributed to, and leveraged by employees. The close integration of various enterprise functions to this end, with the application of best-of-breed tools, constitutes E/KM.

Most knowledge-centric product and service offerings did not exist three years ago. Methodologies and tool suites have evolved rapidly. At the moment, the “marketing” and sound bite engines fueling this management concept and technology genre are in full throttle. The big question for CIOs and vendors is whether there is a “win-win” in investing in E/KM infrastructure.

From our perspective, investments *will* pay off. But target initiatives must be selected carefully. The extreme alternative-inaction and indifference to knowledge management—is a dangerous and costly proposition for any firm. No CIO, for instance, wants to be in the unenviable position of reporting that he or she is doing nothing to support the competitive opportunities that successful E/KM initiatives offer. See Exhibit 2 for our perspective on knowledge-centric product and service offering trends over the next five years.

IV. Enterprise Knowledge

This section explores sources and forms of enterprise knowledge. Organizations can leverage three sources and three types of knowledge, as shown in Exhibit 3.

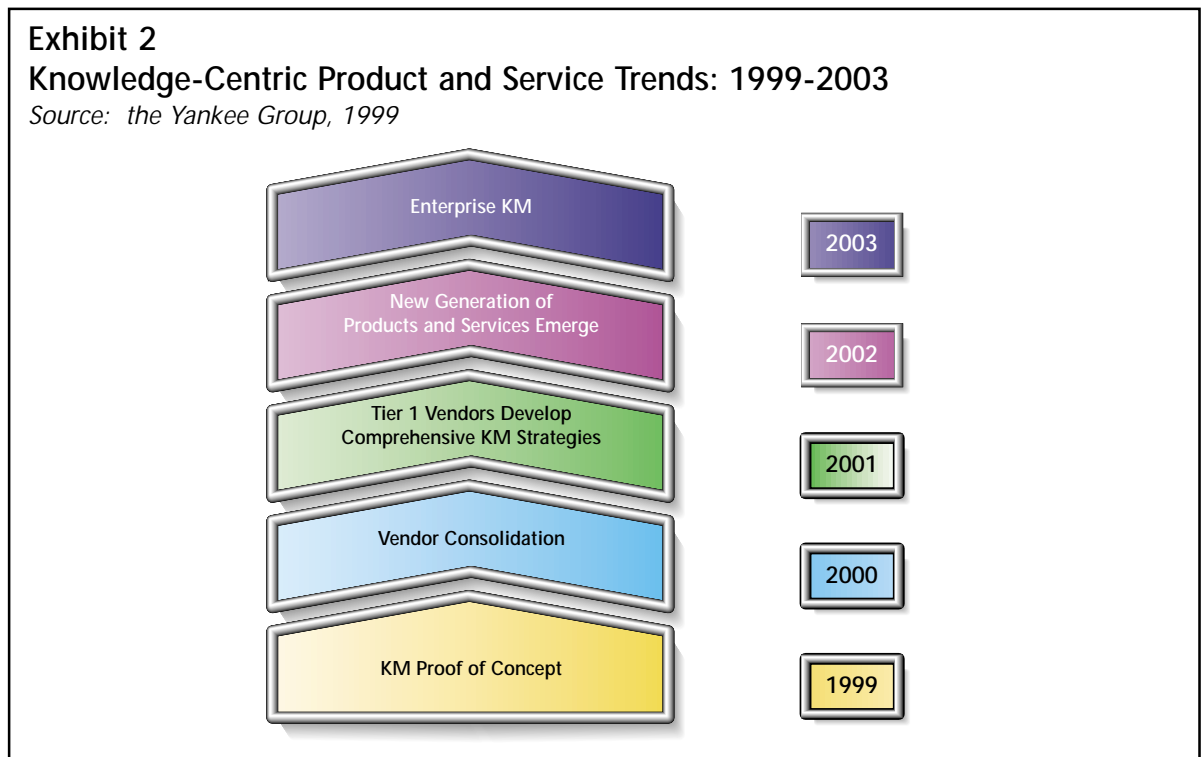
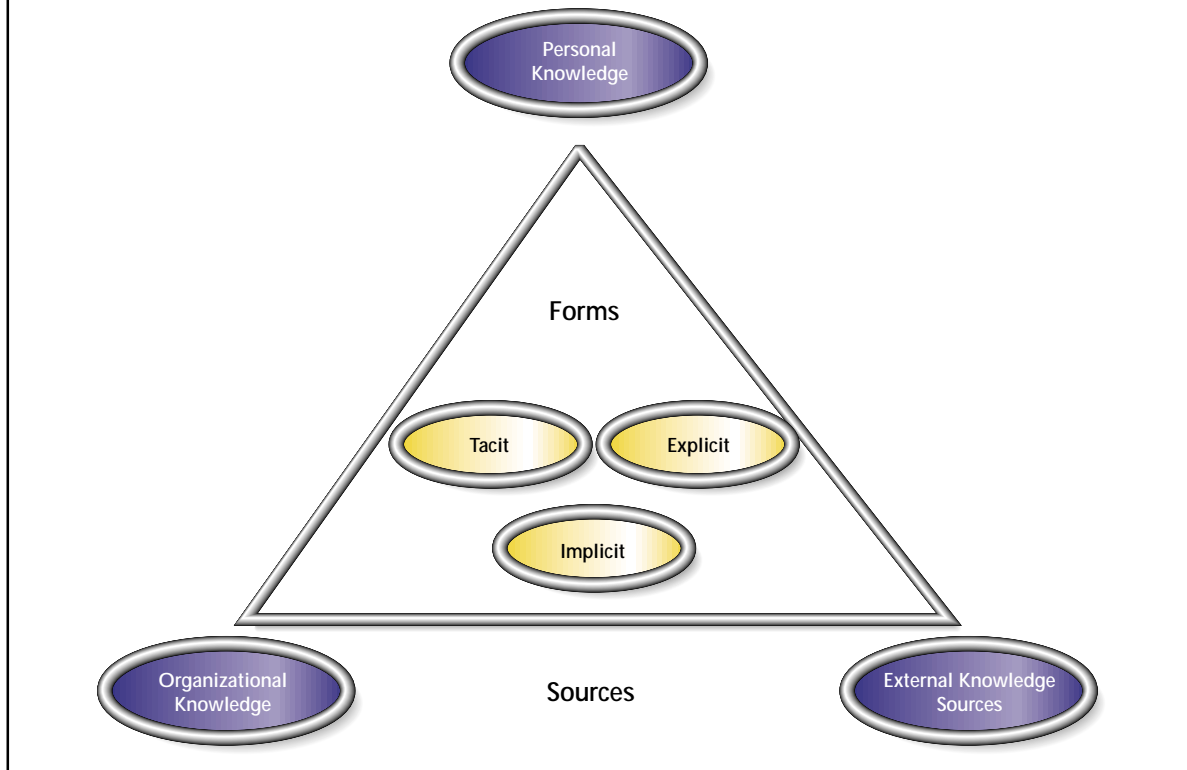


Exhibit 3 Knowledge Sources and Forms

Source: the Yankee Group, 1999



Sources

Personal knowledge is knowledge that takes into consideration the unique capabilities and history of the individual;

Organizational knowledge is embedded within the enterprise's core competencies, mission, values, culture, relationships, policies, procedures, strategy, plans, patents, formulas, brands, methods, structure, workflow, and intellectual property of the enterprise; and

Knowledge from external sources includes knowledge that originates outside the enterprise. Sources of external knowledge include clients, government regulators, suppliers, strategic partners, the community, stakeholders, and others with whom close working relationships have been established.

Forms

Tacit knowledge resides in the minds of individuals, and cannot always be articulated;

Explicit knowledge, or "hard" knowledge, exists in patents, formulae, copyrights, brands, research reports, databases, and best practices that have been made explicit; and

Implicit knowledge exists in enterprise applications, procedural workflow, organizational culture, and other implicit processes that manage the company's operations on a daily basis.

V. The E/KM Product and Service Domain

Each source and form of knowledge represents an important organizational asset that should be identified, understood, leveraged, measured, and replenished. Our August 1997 Report “Knowledge Management: People and the Process”, explores the many issues associated with developing an E/KM strategy. Please refer to that publication for a detailed analysis of strategy, and the important role of people in the process.

In this Report, and in this section in particular, we explore the six primary areas of knowledge-centric products and services (see Exhibit 4). View the E/KM product and service domain as a source of infrastructure and implementation services for related initiatives.

Exhibit 4 E/KM Product and Service Areas

Source: the Yankee Group, 1999



Interactive Exchange

Some knowledge cannot be easily articulated or understood without considerable personalized interaction between those who know and those who need to know. For this reason, to more efficiently leverage the benefits of tacit knowledge, interactive exchange is a critical element of most E/KM efforts. Within the Interactive Exchange section there are seven categories that represent the products and services associated with leveraging tacit knowledge (see Exhibit 5).

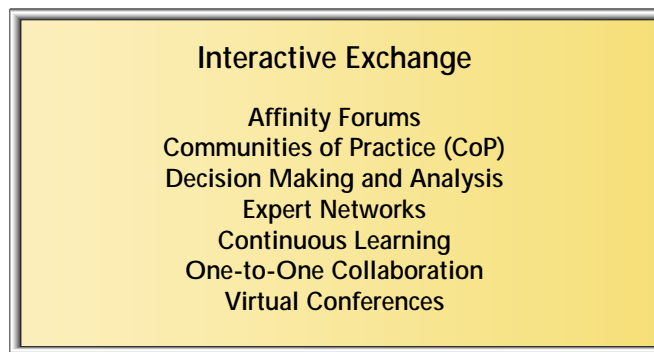
In a typical interactive exchange process, individuals meet either virtually, physically, or in some combination. Groups may collaborate on decisions, learning experiences, problems, or business opportunities. Arrangements can be formal or informal, and related issues to consider include the group's structure, leadership, roles, objectives, and methods.

Explicit material may be produced as a byproduct of the exchange process, but capturing explicit knowledge to be used in other contexts is not the primary objective of interactive exchange. Rather, the objective is to create an appropriate forum where issues can be explored in detail. The expected result is to more efficiently reach a higher level of personal and collective understanding. This should lead to more informed decisions that consider all necessary perspectives, that better stand the test of time. Secondary efforts should be made to capture contextual details as a consequence of the exchange process, where they can be maintained for future reference and analysis.

Exhibit 5

E/KM Domain Area 1: Interactive Exchange

Source: *the Yankee Group, 1999*



The following list shows leading vendors offering products and services in this area.

- **Abuzz** <http://www.abuzz.com>
- **Athenium** <http://www.athenium.com>
- **AOL/Mirabilis** <http://www.aol.com>
- **Arthur Andersen** <http://www.knowledgespace.com>
- **Community Intelligence Labs** <http://ww.co-i-l.com>
- **Concept Systems** <http://conceptsystems.com>
- **Dow Jones University** <http://interactive.wsi.com>
- **Ernst & Young** <http://ernie.ey.com>
- **Instinctive** <http://www.instinctive.com>
- **Knowledge Ecology University** <http://www.KnowledgeEcology.com/keu/>
- **Lotus Development** <http://www.lotus.com/>
- **KOZ.com** <http://www.koz.com/>
- **Microstrategy** <http://www.strategy.com/>
- **Milagro Systems** <http://www.milagro.austin.tx.us>
- **Open University** <http://oubs.open.ac.uk/>
- **Orbital Technologies** <http://www.orbital.com>
- **Screen Porch** <http://screenporch.com/>
- **Teltech** <http://www.teltech.com>
- **Ventana** <http://www.ventana.com>

Content and Intellectual Assets

Some forms of knowledge are more easily articulated and expressed in terms that others can understand. In these cases value can be realized with minimal interactive clarification. But simply making knowledge explicit and putting it “out there” does not ensure that value can or will be realized from it. The Content and Intellectual Assets area includes eight interrelated activities (see Exhibit 6) from content and intellectual asset creation and acquisition, to the applications and tools that organizations employ to manage content.

Exhibit 6

E/KM Domain Area 2: Content and Intellectual Assets

Source: *the Yankee Group, 1999*



This is the area that is most often associated with E/KM. Content and intellectual asset management applications (and services) facilitate the administrative process associated with leveraging tacit and explicit content. Related functions include maintaining detailed content metadata, managing the licensing process and payment of royalties, researching various contextual attributes of intellectual property, and managing the process of creating, manipulating, refreshing, storing, personalizing, and presenting content.

The following is a list of content sources and intermediaries offering services in this area:

- **Bloomberg Financial Markets** <http://www.bloomberg.com>
- **Dialog Corporation** <http://www.dialog.com>
- **Dow Jones** <http://www.dowjones.com>
- **Excite** <http://www.excite.com>
- **NewsEdge Corporation** <http://www.newsedge.com>
- **PointCast** <http://www.pointcast.com>
- **Primark** <http://www.primark.com>
- **Reed Elsevier** <http://www.reed-elsevier.com>
- **Reuters** <http://www.reuters.com>
- **Thomson Publishing** <http://www.thomson.com>
- **Yahoo!** <http://www.yahoo.com>

The following is a list of vendors offering content and intellectual asset management products:

- **Aurigin Systems** <http://www.aurigin.com>
- **Autonomy** <http://www.autonomy.com>
- **Banta Integrated Media** <http://www.banta-im.com>
- **Compaq** <http://www.altavista.com/>
- **Dataware Technologies** <http://www.dataware.com>
- **Diffusion** <http://www.diffusion.com>
- **Documentum** <http://www.documentum.com>
- **Excalibur Technologies** <http://www.excalibur.com>
- **Fulcrum/PC Docs** <http://www.fulcrum.com>
- **Grapevine** <http://www.grapevine.com>
- **Intraspect** <http://www.intraspect.com>
- **Powerize.com** <http://www.powerize.com>
- **Lotus/IBM** <http://www.lotus.com>
- **Mining Co.** <http://www.miningco.com/>
- **Open Text Corporation** <http://www.opentext.com>
- **Perspecta** <http://www.perspecta.com>
- **Plum Tree** <http://www.plumtree.com>

(cont.)

- **Rebus Group** <http://www.rebusgroup.com>
- **Semio** <http://www.semio.com>
- **Verano** <http://www.verano.com>
- **Verity** <http://www.verity.com>
- **Viador** <http://www.viador.com>

Knowledge-Enabled Applications

Knowledge is often embedded in the processes and interactions that individuals, workgroups, and organizations perform on a daily basis. Implicit knowledge has been made explicit, but has been taken one step further. It has become a part of the process itself, and is embedded within the systems and enterprise applications used to manage and facilitate enterprise operations. Within the Knowledge-Enabled Applications section, each of the eight categories of enterprise applications noted in Exhibit 7 could be “knowledge-enabled” to ensure that the organization’s implicit knowledge is sufficiently leveraged.

The benefit of institutionalizing a process in the form of an application is that operational standards are imposed and higher levels of productivity achieved. But there are drawbacks to pre-packaged applications as well. The organization’s products or services are not as easily differentiated from the competition, since the process of adding value is similar for competitors utilizing these applications. Creativity tends to be discouraged, since working outside the functional bounds of the application is not allowed. Organizations often begin to disassociate from the original thought behind the process itself, and new, perhaps more efficient methods, are ignored. Organizations need to employ more flexible systems that take into account the dynamic dimensions of today’s markets and business environments.

Knowledge-enabled applications combine interactive tacit knowledge, relevant explicit content, interactive sharing of information among enterprise applications, process

Exhibit 7

E/KM Domain Area 3: Knowledge-Enabled Applications

Source: *the Yankee Group, 1999*



performance measurement, and integration of the supporting technology infrastructure. When we refer to knowledge-enabled applications, we think of applications that have been enhanced to incorporate knowledge beyond that of the system or application itself. Ideally, knowledge-enabled applications are somewhat dynamic in the sense that they adapt, with minimal intervention, to changes in the processes they are designed to support.

The following list shows vendors offering products and services in this area.

- **Aspen Technologies** <http://www.aspentech.com>
- **BAAN** <http://www.baan.com>
- **Backweb Technologies** <http://www.backweb.com>
- **Brio** <http://www.brio.com>
- **Broadvision** <http://www.broadvision.com>
- **Business Engine Software** <http://www.businessengine.com>
- **Calico Technologies** <http://www.calicotech.com>
- **Cipher Systems** <http://www.cipher-sys.com>
- **RightPoint** <http://www.rightpoint.com/>
- **Epiphany** <http://www.epiphany.com>
- **IDS Scheer** <http://www.ids-sheer.com>
- **Inxight** <http://www.inxight.com/>
- **Kanisa** <http://www.kanisa.com/>
- **Manning & Nappier** <http://www.mnis.com/>
- **Molloy Group** <http://www.molloy.com>
- **Oracle Corporation** <http://www.oracle.com>
- **Peoplesoft** <http://www.peoplesoft.com>
- **SAP** <http://www.SAP.com>
- **ServiceWare** <http://www.serviceware.com>
- **Siebel Systems** <http://www.siebel.com>
- **Silknet** <http://www.silknet.com>
- **SpeedWare Business Intelligence** <http://www.speedware.com>
- **Synergistics** <http://www.syner.com>
- **Trajecta** <http://www.trajecta.com>
- **Wincite Systems** <http://www.wincite.com/>
- **WisdomWare** <http://www.wisdomware.com>

Intangible Asset Measurement (IAM)

Different methods must be employed to measure performance in each knowledge area. Each source (personal, internal organization, external organization) represents a valuable component of the organization's overall intangible assets. But to effectively leverage these assets, it is important to identify relevant items that can be practically measured. And the measure must fit the unique characteristics of the knowledge itself. Within the IAM section (see Exhibit 8) we track related methods in a manner that is consistent with the categories of knowledge itself.

Tacit IAM techniques target the ability of an individual to employ tacit knowledge that is unique to the situation and the person's particular education, skills, and experience. Since situations vary and are difficult to compare to one another, related outcomes must be combined with more objective measures of competence to measure the many perspectives of personal knowledge.

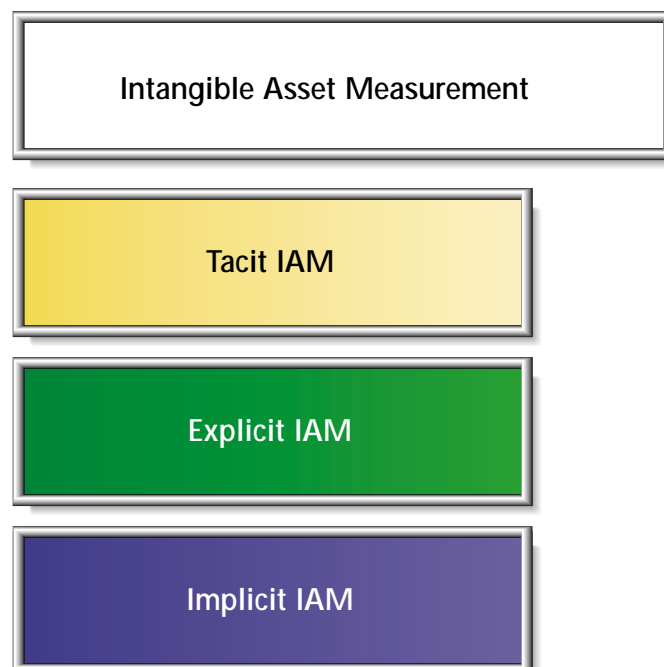
We suggest the following measures to be the most effective for assessing an individual's tacit knowledge:

- Feedback from peers, subject matter experts, customers and other constituents who have frequent or passing interactions in a work setting;
- Recent formal education, focused training, and/or work experience in a particular discipline;

Exhibit 8

E/KM Domain Area 4: Intangible Asset Measurement

Source: *the Yankee Group, 1999*



- Demonstrated competence in a subject measured by a combination of retrospective outcome analysis, simulation techniques, traditional testing, and other standardized methods for assessing relative competence; and
- Value of personal contributions to actual results and toward what has been identified as enterprise objectives, expressed relative to the performance of peers.

Explicit IAM techniques target articulated knowledge, and detail about an individual's specific competence that can be made explicit. Since the value of what has been made explicit varies widely depending on context and other variables, the techniques for assessing its value also vary. The incremental cost of leveraging explicit knowledge is almost inconsequential. So the value that can be derived is significant, but only if the transfer process is managed effectively. We have identified the following measures to be the most effective for assessing explicit knowledge value:

- Subjective measures from a target audience regarding a content artifact's relevance, quality, timeliness, accuracy, clarity, credibility, integrity, and objectivity;
- Subjective measures that have been made explicit by the target audience regarding an individual's (or content artifact's) competence;
- Positive or negative references to explicit content;
- Context measures to identify the relative weight of a content reference;
- Specific revenue, expenses, and changes associated with content artifacts such as brands, patents, formulas, copyrighted material, legal documents, and other explicit intellectual property;
- Known value of similar explicit artifacts to gauge relative efficiency and leverage; and
- Financial metrics associated with aggregate measures of intangible assets.

Implicit IAM techniques measure organizational knowledge that is present in workflow processes, policies, procedures, culture, reporting channels, computerized applications, and methods employed to run the organization, as well as in relationships with customers, suppliers, regulators, the community, and among employees. Efficiency and value of implicit knowledge is best uncovered through comparison.

We have identified the following measures to be the most effective for assessing the value of implicit knowledge:

- Satisfaction levels of constituents, including shareholders, customers, partners, employees, regulators, and the community;
- Efficiency of a process in terms of elapsed time to perform a specific task;
- Turnover of employees, inventory, or assets associated with a particular process;
- Complexity of the task in terms of skills required, approval levels, or people involved;

- Actual outcome of the process, and how this compares to the expected outcome, or the historical outcome;
- Comparison to benchmark and best practice results of similar processes performed by others;
- Comparison to efficiency and outcome of related internal processes or metrics; and
- Comparison to industry benchmarks and aggregates.

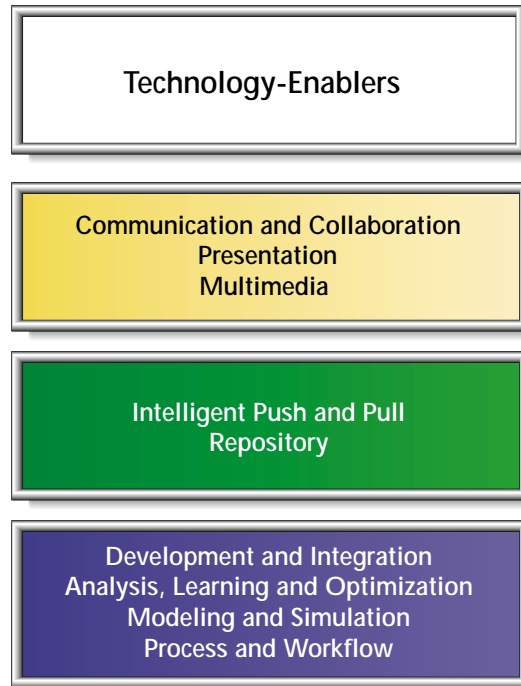
The following list profiles several vendors offering services in this area.

- **APQC** <http://www.apqc.org>
- **Benchmarking Exchange** <http://www.benchnet.com>
- **Benchmarking Partners** <http://www.benchmarking.com>
- **Best Practices LLC** <http://www.best-in-class.com>
- **Compass Analysis** <http://www.compass-analysis.com>
- **Gentia Software** <http://www.gentia.com>
- **L.E.K. Consulting** <http://www.lek.com>
- **Renaissance Worldwide** <http://www.rens.com>
- **SAS Institute** <http://www.sas.com/>
- **Sveiby Knowledge Management** <http://www.sveiby.com.au>
- **The Technology Broker** <http://www.tbroker.co.uk>

Technology Enablers

Technology represents the most significant enabler for sharing knowledge in its many forms. But different technologies are employed to exploit explicit knowledge than might be used to leverage tacit knowledge. Still others are most effectively employed to knowledge-enable applications, or to measure competence and effectiveness. While the entire range of technologies may be employed in one way or another in E/KM initiatives, some technology areas play a more prominent role in successful programs. Within this section, we have identified nine of these categories (see Exhibit 9) that represent the areas most often associated with leveraging enterprise knowledge.

Effective communication and collaboration tools accommodate participants regardless of geographic location, communication application, computing platform, security method, or time zone. Tools range from E-mail and messaging, to groupware and collaborative technologies. The proliferation of standardized presentation tools has been a key factor in the explosion of knowledge-centric products and services. Presentation tools have become a focal point for the delivery of these products and services. Most applications are now “Internet-enabled,” offering more standardized user-friendly access to tacit and explicit content, as well as implicit processes. E/KM practices incorporate both real-time and batch interaction, as well as multimedia capabilities within the interactive exchange infrastructure.

Exhibit 9**E/KM Domain Area 5: Technology-Enablers***Source: the Yankee Group, 1999*

Knowledge workers spend considerable time seeking out high-value content and weeding through vast stores of irrelevant information. What we refer to as “intelligent pull” technologies allow knowledge workers to minimize irrelevant information being incorrectly identified by automatically incorporating content metadata, personal preferences, and sophisticated search methodologies. What we refer to as “intelligent push” uses these same underlying technologies to allow professionals to have highly relevant categories of information automatically sent to them, and to exclude unsolicited messages that are of limited utility. Intelligent push also facilitates transmission of content to recipients with much higher degrees of precision. Repository technologies work in combination with other tools to develop intelligent push and pull capabilities, connect to those who know with those who need to know, act as the central collection point for both structured and unstructured content, and facilitate the process of knowledge-enabling applications.

The analysis, learning, and optimization category includes technologies that are used to access and evaluate large selections of tacit and explicit knowledge, draw conclusions from what has been devised from the results, and optimize further actions independently, with minimal human intervention. These technology enablers are typically used to knowledge-enable applications, improving the efficiency of processes and allowing knowledge workers to focus exclusively on elements of the situation that are unusual, or that require critical thinking. The cost of experimentation in a live environment is high.

Modeling and simulation technologies allow organizations to experiment with various strategies, tactics, people, teams, and combinations of factors to eliminate much of the high-risk guesswork associated with running a business. Process modeling and workflow tools help improve the productivity of processes themselves, and reduce the time required to develop and implement systems. They also facilitate incremental process changes that would otherwise be added to the development “wish list” that might take years to address.

The following list profiles several vendors offering products in these areas.

- **Business Objects** <http://www.businessobjects.com>
- **Cartia** <http://www.cartia.com>
- **Cognos** <http://www.cognos.com>
- **Compaq** <http://www.altavista.com>
- **Constellar** <http://www.constellar.com>
- **Dazel Corporation** <http://www.dazel.com>
- **Dragon Systems** <http://www.dragonsys.com>
- **Hyperion** <http://www.arborsoft.com/>
- **Hyperknowledge** <http://www.hyperknowledge.com>
- **Inference** <http://www.inference.com>
- **Informix Software** <http://www.informix.com>
- **Intellicorp** <http://www.intellicorp.com>
- **Intelligence** <http://www.intelligence.net>
- **Lernot & Hauspie** <http://www.lhs.com>
- **Level 8 Systems** <http://www.level8.com>
- **Magnifi** <http://www.magnifi.com>
- **Microsoft Corporation** <http://www.microsoft.com>
- **Netscape Communications** <http://www.netscape.com>
- **Novell** <http://www.novell.com>
- **Oracle Corporation** <http://www.oracle.com>
- **Perspecta** <http://www.perspecta.com>
- **PictureTel** <http://www.picturetel.com>
- **RealNetworks** <http://www.real.com>
- **SAS Institute** <http://www.sas.com>
- **Semio** <http://www.semio.com>
- **Thinking Tools** <http://www.thinkingtools.com>
- **Vignette** <http://www.vignette.com>
- **Vitria Technology** <http://www.vitria.com>
- **Wave Research** <http://www.waveresearch.com>
- **Weblin Communications** <http://www.weblin.com>

Knowledge-Centric Services

E/KM initiatives create demand for related third-party services, and we have found that the delivery of most knowledge-centric services is handled within the existing practice areas of large services firms. Some organizations, however, will need to significantly modify their existing offerings to keep pace with new technology solutions and increased demand for services. Knowledge-centric application infrastructure integration and enterprise knowledge audits, for example, are two areas that tend to be disbursed among multiple consulting practices. Services firms will need to better coordinate E/KM offerings to minimize client confusion and coordination of resources within the firm. Within the Knowledge-Centric Services section, we have identified six categories (see Exhibit 10) that represent the professional service areas associated with leveraging enterprise knowledge.

Successful E/KM initiatives employ a combination of products and services that focus on key components of “value” that have been defined up-front as objectives of each program. Often, internal resources are redeployed to work on these initiatives. But more often, services from professionals outside the organization are engaged to complement internal resources. This allows the organization to address temporary requirements, or requirements that fall outside the organization’s portfolio of skills.

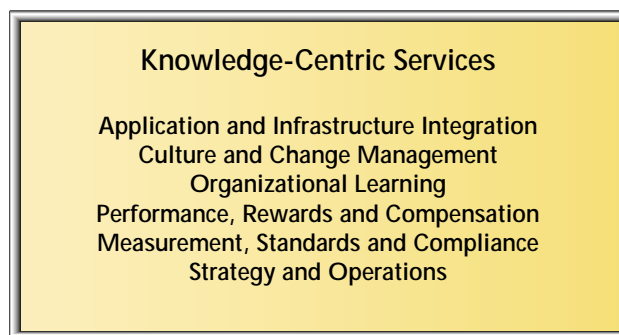
Many enterprise environments do not culturally support E/KM initiatives, requiring significant change. Cultural change must be employed in combination with and in support of systems, standards, rewards, measures, compensation programs, and effective organizational structures. Just as the business environment and available resources of an organization change, so too must its approach and the approach of each employee, toward the new environment. Learning is a continuous process that must occur simply to maintain the current position. To advance a position, the challenge increases exponentially. Services associated with organizational learning include areas as diverse as mentoring, on-the-job training, and management development programs, as well as formal degree programs, classroom product and skills training, personal awareness, and team building exercises.

Technology facilitates a more rapid, systematic, and efficient exchange of knowledge, but effective measurement, standards and compliance issues must be rationalized with important issues such as personal competence, privacy, compensation, and contribution to results. Most performance, reward and compensation programs are static, but address situations that change continuously. Enterprise KM initiatives must institute dynamic

Exhibit 10

E/KM Domain Area 6: Knowledge-Centric Services

Source: *the Yankee Group, 1999*



programs that change with the situation. A clear, consistent, dynamic, and equitable connection must be established between enterprise value, and the relative contribution of constituents. This should include tangible and intangible measures, and short-term and long-term outcomes. The result is better development and retention of top performers, through more appropriate and personalized programs for all members.

Successful E/KM initiatives clearly identify the mission of the organization, and align to that. What the organization perceives as value must be defined. And how intangible assets contribute to realizing this must be understood. Approaches toward optimizing E/KM efforts include better exploiting intellectual capital (IC) within patents and copyrighted material, better leveraging external IC through business process outsourcing, more effectively managing enterprise knowledge risks, and developing effective strategies for aligning the organization's business strategy with its E/KM and IT strategies.

The following list identifies the leading vendors offering services in these areas.

- **Andersen Consulting** <http://www.ac.com>
- **Answerthink Consulting Group** <http://www.answerthink.com>
- **Applied Competitive Strategies** <http://www.competing.com>
- **Arthur Andersen** <http://www.arthurandersen.com>
- **Bain & Company** <http://www.bain.com>
- **Boston Consulting Group** <http://www.bcg.com>
- **Cambridge Technology Partners** <http://www.ctp.com>
- **CAP Gemini** <http://www.capgemini.com>
- **Celemi** <http://www.celemi.com>
- **Collaborative Technologies** <http://www.collaborate.com>
- **Conduit Communications** <http://www.conduit-usa.com>
- **Decision Architects/Monitor Company** <http://www.decisionarchitects.com>
- **Deloitte Consulting** <http://www.dttus.com>
- **Dialogos** <http://www.dialogos.com>
- **Ernst & Young** <http://www.ey.com>
- **Inforte** <http://www.inforte.com>
- **Interact** <http://www.interactdesign.com>
- **Knowledge Associates International** <http://www.knowledgeassociates.com>
- **Knowledge Management Consortium** <http://www.km.org>
- **Knowledge Broker** <http://www.knowledgebroker.com>
- **KPMG Peat Marwick** <http://www.kpmg.com>
- **L.E.K. Consulting** <http://www.lek.com>
- **Leadership 2000/SAIC** <http://www.12000.com>

(cont.)

- **McKinsey & Company** <http://www.mckinsey.com>
- **Mercer** <http://www.mercer.com>
- **Modus Operandi** <http://www.mdusoperandi.com>
- **Nextera** <http://www.nextera.com>
- **PricewaterhouseCoopers** <http://www.pwc.com>
- **Renaissance Worldwide** <http://www.rens.com>
- **Society for Organizational Learning** <http://www.sol-ne.org>
- **Talus** <http://www.talus.net>
- **The Yankee Group** <http://www.yankeegroup.com>

VI. The E/KM Industry Connection

Yankee Group research indicates that the potential leverage realized from tacit, explicit, and implicit knowledge tends to vary by industry. Exhibit 11 offers a relative comparison of E/KM adoption by industry. It also highlights E/KM approaches that offer the most leverage in a particular industry, and the type of knowledge that initiatives should focus on.

We make the following observations:

- The majority of E/KM implementations across industries are still either limited in scope or considered pilot projects.
- No industries have progressed to extensive adoption at this point.
- Pharmaceuticals, biotechnology, chemicals, consulting, tax, audit and the intelligence segment of the public sector tend to be leading the way with successful initiatives.
- The administrative areas of the public sector, agriculture, and mining industries show little or no current activity in E/KM.
- Business leverage tends to be consistent by knowledge type within specific industries, but companies in the same industry may focus E/KM initiatives on different knowledge types if the potential leverage for both types is similar.
- Successful initiatives focus on the type and source of knowledge that tends to differentiate it strategically from key competitors, treating all other sources and forms of knowledge as important, but secondary.

Exhibit 11
E/KM Adoption Status and Leverage by Industry Sector

Source: the Yankee Group, 1999

Selected Industries	Adoption	Leverage		
		Tacit Knowledge	Explicit Knowledge	Implicit Knowledge
Advertising and PR	4	1	2	3
Agriculture and Mining	5	3	3	2
Banking	3	2	2	1
Biotechnology	3	1	1	2
Communications	4	2	1	2
Consulting/Tax/Audit	2	1	1	2
Education/Training	3	1	1	3
Energy	3	3	2	1
Engineering and Construction	4	2	2	2
Entertainment	4	2	1	2
Finance	3	1	1	1
Health Care	4	2	2	1
High-Technology	3	1	1	2
Hospitality and Gaming	4	3	3	1
Insurance	3	2	2	1
Legal Services	4	1	1	2
Manufacturing	4	3	1	1
Media and Publishing	4	1	1	2
Pharmaceuticals	3	2	1	2
Public Sector: Administration	5	3	2	1
Public Sector: Intelligence	2	1	1	2
Public Sector: Regulation	5	2	1	2
Real Estate	3	2	2	1
Retail and Wholesale	4	2	3	1
Transportation & Distribution	3	2	2	1
Travel	4	2	2	2

Adoption Status	Leverage
1-Extensive Adoption	1-High
2-Moderate Adoption	2-Medium
3-Limited Adoption	3-Low
4-Pilot Activity	
5-No Activity	

VII. Goals and Rewards

A leading professional services firm we have studied bases 10% of each employee's compensation on the organization achieving its annual goal. This becomes a powerful inducement for staff members to think and work as a team. But this approach, in our view, is not practiced widely. The chief knowledge officer (CKO) of a major health care firm told us recently, "No one has ever been promoted for sharing information." He was referring to remuneration structures that typically reward information-hoarding and optimizing personal performance, not necessarily to the benefit of the organization as a whole.

E/KM must have a sponsor at the highest levels of the firm to champion the cause. In our experience, sharing knowledge beyond one's personal network tends to be driven by direct rewards for doing so. Unless there is an appropriate behavior-inducing compensation structure, E/KM initiatives can quickly become a waste of time and money. Here is one example of an approach that is working:

Origin Technology in business is a \$1.7 billion IT services company in which the CEO is looking at various ways to ensure timely information-sharing. The company claims an investment of more than \$200 million in its E/KM initiatives, including related training, dedicated resources, processes, applications, databases, intranets, bulletin boards, help desks, and so on. The system is used for a variety of purposes. For instance, SAP programmers at ARAMCO, a major oil customer in Saudi Arabia, use an interactive exchange application for implementation assistance from counterparts throughout the world. In another instance, a salesperson in Asia was able to close a major sale in three weeks, rather than several months, because he was able to demonstrate to a prospect what was actually being delivered to another client division in Europe. The customer was an Origin global customer with divisions throughout Europe and Asia. By more effectively collaborating with other members of the global account team, Origin was able to increase both business and customer satisfaction.

The CEO of Origin is the de facto E/KM champion and is looking to foster more of a partnership feeling throughout the organization, especially in the area of servicing and growing its portfolio of global accounts. He sees the need for specific measurable results, but not necessarily financial ones. First, he insists that top management must be visible and committed to global accounts. Financial compensation for staff includes bonus plans that hinge on meeting local sales quotas as well as global account goals. But the CEO is not completely satisfied and thinks that more non-monetary rewards are needed, such as President's awards for collaboration and sharing.

This notion resonates with another CKO at a major health care organization. He recognized that its reward system had to change, and commissioned focus groups that reported: "Recognition is one of the most important rewards. People will share if they are recognized by management as 'sharers'." Other suggestions of this focus group included: develop communities of practice, open interactive exchange forums, and let users send anonymous messages. Strong connections between goals and rewards are critical for any successful E/KM initiative, but rewards need not be financial.

VIII. Implementation: Strategic Opportunities and Risks

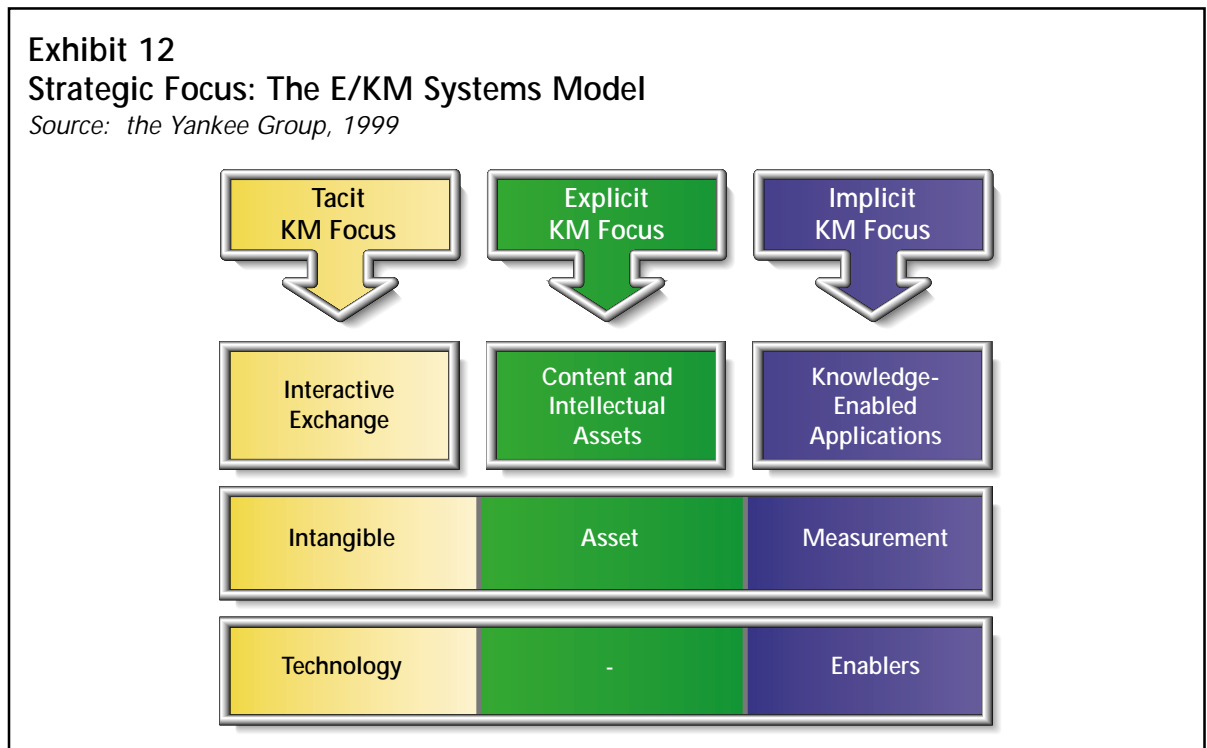
The E/KM Systems Model

The E/KM systems model (see Exhibit 12) must be closely aligned with the organization’s strategic focus. As noted in Section VII, organizations will leverage all forms of knowledge in effective E/KM efforts. But the strategy should stipulate which form of knowledge differentiates the organization from its competitors. Technology infrastructure should focus primarily on supporting this form of knowledge, with a secondary emphasis placed on supporting each of the other forms.

End User Strategic Alternatives

In our 1997 Report “Knowledge Management: People and the Process” we profiled 55 user cases. Below we provide an update on a four of those examples.

IBM Corporation has transformed its research and development organization into a profit center, increasing licensing revenue by an order of magnitude since Lou Gerstner took the helm in 1993. IBM controls one of the technology world’s largest repositories of intellectual capital, investing 6.2% of revenue in 1998, or approximately \$5 billion. Now it is also a leader in leveraging this explicit knowledge in the form of its patent portfolio and related intangible assets. Rather than focus on protracted litigation and exclusionary tactics, IBM has forged alliances with some unlikely partners. Good recent examples include IBM’s \$16 billion seven-year OEM and technology licensing agreement with competitor Dell Computer, and its five-year \$3 billion OEM and technology cross-licensing deal with rival EMC Corp.



Pfizer's competency model for hiring treasury executives contains knowledge-building, knowledge-sharing, and financial skills. The company now recruits employees with a more forward thinking, team-oriented philosophy, without sacrificing functional depth. Pfizer is leveraging the tacit knowledge of recognized experts to more efficiently train new-hires.

Monsanto's SAP implementation includes an E/KM architecture team that is building a knowledge base with feeds from over a dozen business units. Its objective is to make knowledge-sharing easy and effective company-wide in its new incarnation as a "life sciences" company. Monsanto is leveraging the organization's implicit knowledge by implementing application standards and knowledge-enabling applications with employee expertise and content.

Cadence Design Systems has created a global "Design Network," that cuts the cycle time for complex system-on-a-chip design and fabrication by 50% or more. This dramatically reduces product time-to-market for Cadence clients. It accomplishes this by leveraging the collective core competence of both Cadence and its customer, and combining this with explicit knowledge in the form of design templates. In the future, Cadence hopes to evolve its model from one that relies mostly on tacit knowledge of its highly paid experts, to one that more effectively leverages intellectual capital reuse from its global Design Network.

We could go on to describe many other excellent examples, but the conclusion is clear. E/KM initiatives are no longer limited to a few innovative organizations. We've found that best practices align E/KM and business strategies. The year 1998 was a transition for E/KM, and Global 2000 CEOs now recognize it as a key strategic imperative.

Opportunities and Risks

As with many technology-driven initiatives, early adopters of E/KM stand to gain from distinct competitive advantages during this window of opportunity that is rapidly closing. Some of the opportunities that can be expected include:

- More timely intelligence on competition;
- Faster access to accurate answers;
- Higher productivity of knowledge workers;
- Improved morale;
- More appropriate rates of staff turnover;
- More innovative solutions to problems;
- Retention of knowledge from consultants and former employees;
- Stronger connections between goals and rewards;
- Ability to respond more quickly to marketplace shifts;
- More effective organizational learning;

- New connections between sources and uses of knowledge;
- Better understanding of capabilities and resources;
- More appropriate decisions;
- More effective management and governance; and
- Increased revenue, margins, and profits.

However, keep in mind that early adoption also has its risks. Many of the infrastructure components described in this Report are immature, and the companies producing them are in early stages of development. As noted previously, we are forecasting a consolidation of vendors over the next 24 months. While companies with extraordinary technologies tend to easily find suitors, even friendly acquisitions can negatively impact operational systems and architectures. But the benefits clearly outweigh the risks, and the gap will continue to widen.

Organizations throughout the world are dealing with an unprecedented convergence of challenges that include mergers and acquisitions, globalization, deregulation, Y2K-compliance, the European Monetary Union (EMU), as well as internal challenges. Technology budgets and staffing are always resource constrained, and CIOs have little flexibility for “experimental” initiatives. This is why it is so important to connect the organization’s E/KM strategy with its overall strategy, to help ensure success. Firms in virtually every industry have proven in a short span of time, the intrinsic value of E/KM and its potential to increase top-line performance and bottom-line results. Knowledge-empowered organizations in our view will be the sustained winners over time.

IX. Conclusion

The Yankee Group’s E/KM Product and Service Domain highlights many of the issues enterprises confronted in related initiatives, and helps to put E/KM in perspective. Excellent examples exist in pharmaceuticals, chemicals, high-tech, and consulting, as well as in the intelligence community. But E/KM is in the early stages of adoption in most other industries. Organizations in the same sector often employ different approaches, and this is appropriate. The important issue is to align E/KM and business strategies, and focus on sources of knowledge that differentiate the organization strategically from its competitors.

Initiatives that ignore cultural factors and appropriate reward systems are destined to fail. Consultants and systems integration (SI) firms, in our view, have leading roles to play in E/KM. While the market for related products and services is nascent at this point, expect the post-2000 share of knowledge-centric products and services, as a percentage of total product/service expenditures, to increase dramatically.

We believe that enterprise knowledge management, as both a management philosophy and a technology phenomenon, is here to stay. But expect the value proposition associated with it to be realized over time. End-user organizations are faced with a dilemma on this issue. They cannot afford to ignore this growing trend. Yet currently, large-scale mature E/KM initiatives are rare. The Yankee Group has found that many of the most compelling products and services that support these initiatives, have not been sufficiently market-tested. But waiting in the interest of reducing technical or business risk, may result in a sustained competitive disadvantage!

Further Reading

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Business/IT Strategy Alignment: An Owner’s Manual, Yankee Group Management Strategies Planning Service Report, November 1997.

“Activity-Based Costing: Optimizing IT Processes Is as Easy as ABC,” *Yankee Watch Management Strategies*, Vol. 7, No. 11, November 1997.

Knowledge Management: People and the Process, Yankee Group Management Strategies Planning Service Report, August 1997.

The Yankee Group's own Howard Anderson predicts:

**Which tech companies
will win the race for
glory in 1999?**



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Check out the March 1999 issue of UPSIDE Magazine to see whom Howard selected as the forerunners in market share leadership, innovation, overseas strength, strategic alliances, and management.

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For more information on this or other Yankee Group publications please contact:

The Yankee Group in the U.S.:

Headquarters: 31 St. James Avenue, Boston, MA 02116-4114
Phone: (617) 956-5000, Fax: (617) 956-5005
E-mail: info@yankeegroup.com

The Yankee Group in Silicon Valley:

951 Mariner's Island Blvd., Suite 260, San Mateo, CA 94404
Phone: (650) 356-1960, Fax: (650) 356-1966

The Yankee Group in Austin:

816 Congress Street, Suite 1100, Austin, TX 78701
Phone: (512) 480-2249, Fax: (617) 210-0030

The Yankee Group in Chicago:

2502 North Clark Street, #213, Chicago, IL 60614
Phone: (773) 244-1220, Fax: (773) 244-1286

The Yankee Group in Washington, D.C.:

8251 Greensboro Drive, Suite 700, McLean, VA 22102
Phone: (703) 790-7608, Fax: (703) 790-2846

The Yankee Group in Canada:

10 Victoria Ave., P.O. Box 584, Brockville, Ontario, K6V 5V7
Phone: (613) 345-2622, Fax: (613) 345-5681

The Yankee Group Asia-Pacific:

Kasamatsu Chiyoda Bldg., 5F, 2-17-4 Nagata-cho,
Chiyoda-ku, Tokyo 100, Japan
Phone: +81-33-581-7751, Fax: +81-33-581-7754

The Yankee Group in Australia:

Conserve, P.O. Box 390, Cammeray, NSW 2062, Australia
Phone: +02-9964-9555, Fax: +02-9929-0475

The Yankee Group in the UK:

The Old Free School, George Street, Watford,
Hertfordshire, UK WD1 8BX
Phone: +44-1923-246511, Fax: +44-1923-242456

The Yankee Group in the Netherlands:

Verdonck, Klooster & Associates, Westwaarts 56
2711 AC Zoetermeer
Phone: +31 79 352 22 25, Fax: +31 79 352 24 81

The Yankee Group in Spain:

Askin SA, Avenida Valdelaparra 27, 28108 Alcobendas, Madrid
Phone: +34 91 661 8304, Fax: +34 91 661 0147

The Yankee Group in Switzerland:

MSM AG, Rhyпарк, Rheinweg 4, Postfach 971
CH-8201 Schaffhausen
Phone: +41 52 624 2121, Fax: +41 52 624 7364

The Yankee Group in Brazil:

Dario Dal Piaz, Av. Brig. Faria Lima, 1306-5 Andar
01452 000 São Paulo-SP-Brazil
Phone: +55-11-3067-4640, Fax: +55-11-3067-4554

The Yankee Group in Chile:

Proteus Consultores, Avenida Vitacura 3501, Oficina 302,
Vitacura, Santiago de Chile
Phone: +56-2-207-9295, Fax: +56-2-207-9296

The Yankee Group in Colombia:

Herman Maestre, Cra 13 #74-92, Suite 200, Bogota, Colombia
Phone: +571-321-7690, Fax: +571-321-7685

The Yankee Group in South Africa:

Kim Thiye, Sandton Square
2nd Floor, West Tower, Maude Street, Sandown
Johannesburg, South Africa
Phone: +27-83-676-5625, Fax: +27-11-881-5611

The Yankee Group in United Arab Emirates:

Robert Faissal, Primark/Yankee Group Middle East, P. O. Box 549
Abu Dhabi, United Arab Emirates
Phone: +971-50-618-5558, Fax: + 971-2-657-117

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