

■ Case Study

Managing Corporate Knowledge: A Comparative Analysis of Experiences in Consulting Firms. Part 2

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Knowledge management is fast becoming the terminology of many companies' efforts to gain competitive advantage from the efficient and effective management of their knowledge assets. Consultancies have been in the forefront of thinking about how to manage knowledge because their own success depends heavily on developing, selling, and applying ideas. This paper develops and applies a framework that compares and contrasts several consulting firms' efforts in implementing knowledge management programmes. Our framework analyses the specific actions undertaken by the firms based on the alignment of their people, processes and technology with the business strategy, context and goals. Conclusions are drawn based on the lessons learned and the results reached in each case. Copyright © 1999 John Wiley & Sons, Ltd.

**There follows the Appendix to this Case Study
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APPENDIX: SUMMARY ANALYSES OF KNOWLEDGE MANAGEMENT EFFORTS

Arthur Andersen

Context

Arthur Andersen has moved during the last two decades from being primarily auditors and large scale systems programmers to a more complex business entity with additional services that include legal practices, corporate finance, general management consultancy and outsourcing. The result of this expansion was over 80 'communities of practice' within the firm. Traditionally, the primary mechanisms for managing and applying knowledge were training courses and on the job coaching. However, changes in the business environment that is more complex and more rapidly changing and changes in the client's businesses set the requirement for more active means of supporting consultants with knowledge.

Goals

'The whole purpose of our knowledge strategy is to increase the organizational knowledge available to our associates so we can better serve our clients' (Rian Gorey, director of the Knowledge Services Competency Centre).

Strategy

Initially the strategy focussed on managing explicit knowledge. Knowledge was seen as something that could be 'packaged and passed around'. The importance of tacit knowledge as well as the need to consider the 'process-view' of knowledge

management, that deals with connecting people, communities and ideas, were realized (and hence, became core part of the knowledge strategy) only after the first results of the initiative were appraised.

The Knowledge Strategy Team was responsible for formulating the knowledge strategy. The team aimed to assess the opportunities and understand the current and emerging economy in knowledge management.

Culture

Financial incentives embedded in the firm promoted sharing and teamwork. Arthur Andersen’s partners shared income on a world-wide basis, each partner having shares or units in worldwide equity. This underlying structure, along with frequent interactions across geographies, had helped promote a culture of sharing. But beyond the direct financial incentives emphasis was put on the incentive of doing great work on behalf of the clients. Furthermore, professionals were helped in using KM systems by cutting out all the information overload. This also made it easier for them to contribute, rather than just passively gather or read information.

Organizational Infrastructure

There were three levels of competency centres, set up for different purposes. Level one centres, which included the Business Consulting competency centres, used knowledge to enhance the competency of the individual. Level two centres, such as the Knowledge Services Competency Centre, focused on using knowledge to develop new service lines, while level three competency centres helped the organization deliver services more effectively.

Within the competency centres were structures and individuals that facilitated the knowledge management and sharing process. The Business Consulting competency centres, for instance, had knowledge managers, coordinators, and champions who worked together to define the needed skill sets and development plans and frame the types of services AA provided to its clients. Each topic area, or knowledge domain, had various dedicated personnel responsible for authoring, editing, and publishing the knowledge. The Global Best Practices area employed a series of information specialists, journalists, and writers to work with subject matter experts in the field to compile best-practices content. Business Consulting employed people and processes to publish and post Business Consulting-relevant materials.

Technological infrastructure

AA identified two kinds of knowledge processes—*divergent* and *convergent*—that helped the company maximize the positive impact of knowledge. Through the divergent process, which included research and sharing, data were collected from many people and sources. The convergent process initiated when experts put a conceptual fence around the data and tried to understand them and find their meaning. The technological platform that supports these processes consisted also of divergent and convergent systems:

Divergent systems were forums to which everyone could post a question, idea, or document. These systems required no central validation and there is no control element; they were completely open to support interactions across communities. *AA OnLine* was the firm’s most important divergent system. It was based on a Lotus Notes platform and had three primary components; announcements, resources and threaded discussions. Announcements were aimed at the group as a whole, had a 30-day lifecycle, and did not require a response. Resources were documents that had a longer life-span and relatively high value. Finally discussions were interactive dialogues, using groupware, that began with an originating question or comment followed by a series of responses.

Convergent systems were designed to supplement training and to help practitioners sell and perform engagements. These systems included authoring, editing and publishing processes as well as filtering processes to ensure validation of stored knowledge. They included an engagement information system, a repository of tools and methodologies, with the most representative being the *Global Best Practices (GBP)* repository.

	Business processes and roles	Technology
Generating	A group responsible for monitoring daily the GBP was established. Questions and issues being raised in the divergent systems are monitored in order to identify trends, harvest best ideas and generate proactive research.	Divergent systems ensured that new ideas are introduced, making it possible to see what emerging ideas were hot and what anticipated topics were attracting interest.

	Business processes and roles	Technology
Organizing	The role of Knowledge Manager was in place since 1994, even before any technological platform was installed. One of the roles of knowledge managers was to pull together the best material, and populate, refresh and manage the space in AAoL for their Competency Centre. Each topic area or knowledge domain had various dedicated personnel responsible for authoring, editing, and publishing the knowledge.	The GBP was based on a classification scheme that organized the enterprise's activities into operating and supporting processes. For each process, the GBP knowledge base included predefined categories and sub-categories such as description of best practices, examples, performance metrics, relevant AA experience, template presentations, etc.
Developing	Subject-matter experts were on a constant base reviewing and extending the Global Best Practices. Their duties included reviewing and approving material entered in divergent systems in order to become part of the convergent system.	The GBP knowledge base provided support for knowledge development through the template presentations and the guide (or approach) to implementation: this 3 to 10-page document described in general terms each process and allowed engaged consultants to build on existing knowledge and further extend or refine it.
Distributing	Knowledge managers were appointed in large offices to help consultants gather and share knowledge.	GBP's were distributed through CD-ROMS and intranets.

Results

- GBP was populated with thousands of knowledge pieces, a large number of diagnostic tools and a wider range of knowledge objects aiming to support the professionals in the field.
- Ten to twenty postings were made daily on the divergent systems.
- In 1995, the firm began offering knowledge management services to clients while it has started selling parts of its Global Best Practices externally as 'packaged knowledge'.

Lessons learned

- Important to focus on leadership (visions, values, and behaviours), strategy (knowledge to do what) and user needs (How this will improve my day).
- Need to create an organizational framework (network of experts, network of knowledge managers).
- Knowledge management must become part of people jobs. It must be embedded in what people do and not be additional work for employees.
- For technological applications to succeed, they must attain critical mass and be able to draw people to them. They must be as uniform as possible, in order to require little learning effort, and be flexible.

Booz-Allen & Hamilton

Context

Until the late 1980s, Booz-Allen had essentially been an affiliation of individual partners 'fieldoms'. Partners serviced their own clients under what was little more than a shared administrative structure and brand name. They were rewarded for the revenue they personally brought to the firm, and had little incentive to help other partners build their own profitable client relationships. Under this structure, there were few incentives to share knowledge and innovations across the partnership. Learning tended to occur at the individual and client team level, stimulated by particular engagements. While some informal networks existed, there was no explicit mechanism for sharing new insights beyond individual offices.

The company has experienced tremendous growth over the last decade. The staff has almost doubled from 3500 in 1988 to more than 6500 today. The firm's rapid hiring rate has meant training new employees and bringing them to speed about the organization and its knowledge structure as quickly and inexpensively as possible.

Goals

1. To make engagement teams more efficient in creating and delivering values to clients
2. To fuel the growth engine that was crucial to maintaining the vitality of the firm

Strategy

The strategy for making client teams more efficient involved three dimensions:

1. Acquiring information about the structure and economics of the industry or market
2. Applying the frameworks or models developed in previous engagements to the present client’s situation and
3. Benefiting from lessons learned about the process of managing previous projects of a similar character, to avoid repeating the mistakes of the past, and utilize all that could be known about best practices across all of Booz-Allen.

Culture

Knowledge Managers had among their responsibilities the duty to help leverage the capabilities of KOL (see below) by fostering a knowledge-driven culture within engagement teams.

The firm established a new partner-compensation system that would better align partners’ incentives with the strategic interests of the firm. In place of highly variable individual bonuses, partners would each receive a uniform percentage bonus on their base compensation, depending on the overall results of the firm. Base compensation was in turn determined according to a combination of seniority and contribution in the institution on five dimensions of which revenue generation was only one element.

The firm strived to overcome human barriers to change by building a culture where everyone was interested in the content—the firm’s best ideas—that KOL would provide. Team-building and the elimination of artificial boundaries were also addressed. Incentives were put in place to encourage the sharing of knowledge: first publicizing the value of the knowledge base, then rewarding participation, and finally recognizing knowledge creation as part of consultants’ performance appraisals.

Technological infrastructure

Knowledge-On-Line (KOL) was based on intranet technology. The system was built on Netscape Enterprise Server and Netscape News Server to support a variety of intranet applications, including:

- A database-driven expert skills directory
- A firm-wide knowledge repository able to retrieve information in multiple data types
- Employee directories and
- Newsgroups that facilitate global project collaboration.

Organizational structure

Special Interest Groups (SIGs) were groups of consultants with specific shared interests brought together under an informal infrastructure. Knowledge Managers, were active professionals who participated in engagements and helped leverage the capabilities of KOL. A key component of KOL’s operation was the identification of Knowledge Managers who spent a percentage of their time supporting the system by either entering information or facilitating knowledge creation.

The Chief Knowledge Officer was an executive management position who had four responsibilities:

- Manage all R&D activities around creating and sharing new knowledge
- Build an infrastructure (including both people and technology) to facilitate the sharing of the knowledge
- Create change management and communications processes to support the behavioural changes needed to make the solution successful
- Design and implement the processes for sharing, collaborating and using knowledge.

Business processes and roles	Technology
<p>Generating Innovation was sponsored by establishing a series of research linkages to business schools and by encouraging the publication of intellectual capital. By 1997, the firm was engaged in eleven significant joint programmes with leading academics, and, through both its practices and SIGs was publishing a series of Viewpoint* publications. The firm also launched the <i>Journal of Strategy & Business</i>, that became a highly successful business publication.</p>	<p>The News Server allowed global teams of consultants to discuss a variety of company-and non-company-related topics via message threading and real-time discussion groups. Consultants could engage in either private or public discourse within the firm.</p> <p>KOL included ‘Idea Mart’—a virtual mart for selected intellectual capital and ideas on clients, services, industry sector, etc.</p>

	Business processes and roles	Technology
Organizing	SIG were launched to identify, consolidate and organize what was known within the firm on particular subjects.	KOL housed an expert skills directory—a database application that helped match consultants' expertise with clients' needs. Booz-Allen uses a verification process to designate consultants as knowledgeable, experienced, or recognized experts on a particular topic. Information submitted for intranet publication included an abstract developed by a Knowledge Manager. Information searching on KOL was primarily based on such metadata for improved effectiveness (easier to locate the 'right' content) and efficiency (availability of metadata allow consultants to determine if something is of high value to them before downloading the entire document).
Developing	A matrix-type reorganization in which columns were functional practices (strategic leadership, operations and information technology) and the rows were industry practices, such as financial services. Most partners and staff would live within both an industry practice (called a Professional Community) and a functional practice. Knowledge in each area is built through research, training programmes and staffing rotations on engagements. Furthermore, a primary role for SIGs was the shaping of new 'service offerings' for clients.	KOL provided a virtual training centre, called 'Skills and Methodologies', that contained informative and interactive training materials on thematic areas and BA&H services.
Distributing	Another objective of the SIGs was to assemble teams of experts that could help partners disseminate, sell and deliver these new offerings to their clients. A primary responsibility of the Chief Knowledge Office was to enhance the consultants' ability to create and share knowledge.	Consultants could dial into KOL through either a public network (such as the Internet) or Booz-Allen's own private network.

*Viewpoint titles include: 'Leveraging suppliers: the extended enterprise', 'Consolidation in capital markets' and 'Convergence in the media and telecommunications industries'.

Lessons learned

- The biggest benefit of basing Knowledge On-Line on Web technology is that it helped bridge the islands of knowledge that reside within Booz-Allen. In addition, the intranet provided an overarching framework where it is possible to marry people, process, content, and knowledge.
- Creating a medium for knowledge transfer was arguably the easiest challenge for Booz-Allen. The greatest barrier to change is rooted in human factors. In conjunction with the technology, Booz-Allen strived to create an organization and culture that would support the sharing of knowledge on a regular basis.
- Involvement at all levels of the firm is critical. The deployment of KOL significantly changed the work process within Booz-Allen. Senior officer support underscored the firm's commitment to this change. In addition, buy-in and early involvement by different practices within the commercial business provided a level of ownership that helped sustain the project.
- Integration of best-of-breed technology is a complex venture that can pay off over the long term with greater flexibility, reduced costs, and vendor independence.
- The Web spreads fast and Booz-Allen needed to move quickly to gain control over grassroots projects that were developing.
- The consultants themselves, rather than the Knowledge Managers, are most often the creators of knowledge. Therefore, making content submission easy was critical to the long-term success of a dynamic knowledge store.

Results

- Ability to leverage and use its best thinking for all clients, on every assignment.
- The firm has doubled its publication output—one of its stated goals.
- Emergence of market for knowledge management services. Development of new service for BA&H.
- Reported ROI for KOL: 1398%; Payback: 0.19 years.

Ernst & Young*Context*

Ernst & Young International (EYI) was a global confederation of professional service organizations resulting from the 1989 merger of Ernst & Whinney and Arthur Young. Its US subsidiary employed 25,000 people in three business units: tax, assurance and advisory services, and management consulting. In addition, the firm was made up of diverse practices (called 'communities of interest') that focused on industries, service lines and business processes.

Goals

- To build a 'true knowledge-sharing culture, one in which an individual will willingly rely on the work of another individual whom they have never met, and whose name might not even be able to pronounce'.
- To credentialize E&Y as an excellent service provider because of how it managed its own knowledge.
- To build a global knowledge infrastructure with people in place who have very clearly defined responsibilities and authority.

Strategy

E&Y spend about 6% of its consulting practice revenues on knowledge management and related technology. Its approach was based on the centralization and standardization of critical knowledge management processes, and formalized roles and responsibilities for both the content and management of those processes. Five value-adding 'mega-processes' were identified: sales, service delivery, people management, strategic services development, and knowledge management. Each process was subsequently mapped at several levels, and performance planning and evaluation was restructured around the five processes. The knowledge management strategy of the firm had been formalized into an approach called the Accelerated Solutions Environment, which involved the rapid application of E&Y knowledge, models, and approaches to client situations in facilitated large group settings.

The Centre for Business Knowledge, the implementation arm of the CKO's office, assured that the overall strategy was being put in practice, by designing, managing, and enforcing the architecture and technology standards that enabled communities of interest to further develop and share the content they generated from client engagements.

Culture

The cultural transition of E&Y into a knowledge-sharing firm had begun in 1993, when the business leadership focused on knowledge as a way to operationalize the firm's strategy. A strategic decision was made to build knowledge into performance standards for everyone in the company. Every member of E&Y was required to have objectives in all five process areas, and results were linked to incentive compensation. In the case of knowledge management, the initial emphasis on contributing and sharing knowledge soon expanded to include the development of new knowledge and the reuse of existing knowledge. This had required considerable work on how best to measure knowledge. The CBK collaborated with Human Resources and the service lines to develop measurements, leading the thinking process and providing the systems that made it possible to track knowledge contributions, development, and retrievals. Measurement was supplemented by self-reporting, particularly on the reuse of knowledge.

In addition, part of the responsibilities of the new organizational roles was the fostering of the knowledge-sharing community. One of the primary roles of the Chief Knowledge Officer, for example, was to act as a highly visible champion of knowledge sharing within the firm and to educate employees as well as clients and the media about the company's knowledge management activities.

Technological infrastructure

The E&Y Knowledge Web had a three-tier architecture. The actual content resided at the bottom level in repositories that were not filtered for content. Organization of this material was provided by the architecture's second tier in the form of 'containers', knowledge bases, and navigational support systems. The first tier of the Kweb, called the catalogue, listed the various knowledge bases, described their content, and provided search tools and paths for users to find their way to the specific information they needed.

By 1996, Lotus Notes had been selected as the primary technological platform for capturing and disseminating internal knowledge, but Web-based technologies were used as a primary tool for external knowledge searches and was considered as an alternative option.

Organizational structure

E&Y developed a multi-tiered governance structure for the knowledge process, vesting ownership in a chief knowledge officer and Centre for Business Knowledge. It also defined roles for Knowledge Networks, which were affiliated with individual practice areas and communities of interest, and articulated the ways in which knowledge would be captured, encoded, stored, and deployed. In addition, Consulting Services had established two other knowledge centres, the Centre for Business Innovation¹, and the Centre for Business Transformation². To ensure consistency across business units, a Knowledge Council was formed at the firm level; it set standards and policies for major decisions involving architecture and technology. The need for world-wide consistency led to a Global Knowledge Steering Group which set knowledge management policies in such areas as client confidentiality and copyright conformance, and enforced the E&Y belief that it must have common technology platforms, architectures, and taxonomies all over the world for everything from communicating by e-mail to the transmission of massive documents.

Knowledge Networks consisted of a smaller number of senior members of a practice area or community of interest who were formally designated to lead the group's processes of acquiring, developing, and sharing knowledge. Each network 'owned' its own knowledge base.

Another role, that of Steward, had emerged as well. Stewards had hands-on responsibility for managing a network's knowledge base.

	Business processes	Technology
Generating	The Centre for Business Innovation was aiming at creating new knowledge at a high level by performing early-stage research. In addition, knowledge was generated by engagement teams during client projects. Teams decided what material was valuable enough to retain.	N/A*
Organizing	The Centre for Business Knowledge was responsible for collecting and archiving knowledge gained from engagements and outside sources. Network Coordinators worked with particular networks, assisting them with CBK categories, formats, and search tools, helping them manage their content, and ensuring that the work was carried out in conformance with CBK process standards.	Containers were standardized software applications for organizing, housing and navigating through content. They provided templates for coding knowledge, based on the nature and type of data or raw material. Container types included periodicals, document repositories, and description of leading practices. One form of container for packaging engagement material was called PowerPacks. In it, networks published their most important filtered material, adhering to a standard template. Every PowerPack followed the same classification scheme and had the same navigational properties. PowerPacks represented a synthesis of the best material available on a particular topic. These syntheses were limited to 50 megabytes, so that they could be portable. All PowerPacks were organized into eight categories: people, sales & marketing, leading practices, articles & research, learning resources, regulations and standards, service delivery, and network communications.

*Information not available.

¹The Centre for Business Innovation performed early-stage research and created new knowledge around emerging issues in technology and management.

²The Centre for Business Transformation was primarily structuring knowledge into methodologies and automated tools.

	Business processes	Technology
Developing	<p>The Centre for Business Transformation structured knowledge into methods and automated tools.</p> <p>Knowledge Stewards were members of engagement teams who ensured that the content created by the engagement flowed back into CBK repositories making sure that knowledge was packaged in the most appropriate way and that they collected the best material currently available.</p>	<p>A way to add value to stored information was to pull nuggets out of their originating documents, creating 'knowledge objects' that could be reused. New instructions were provided, together with descriptions of settings in which the objects could be applied.</p>
Distributing/sharing	<p>The Knowledge Services Group provided knowledge navigation services to professionals through its call centre, conducted business research through a firm-wide library system and 70 librarians who were distributed globally, and interpreted emerging trends and issues through its business analysts.</p> <p>Network Coordinators were making sure that their networks were connected to the rest of the firm, were receiving the information and research they needed, and were taking advantage of the learnings of others.</p> <p>Network Stewards, typically senior consultants or managers, were responsible for oversight of the network's knowledge assets—the collection of best practices, innovative work examples, past client experiences, etc.</p>	<p>The firm had two platforms for knowledge sharing—Lotus Notes and web-based technologies. The KnowledgeWeb took advantage of the strengths of each technology—Lotus Notes in its ability to provide off-line access to content through a practitioner's hard disk, and web technology with its ability to do large scale searches and provide online access to large quantities of content.</p>

Lessons learned

- 'All we knew was that we needed process ownership for knowledge management at the firm level if we were going to be a world-class provider of professional services to our clients' (John Peets, Chief Knowledge Officer).
- 'We learned that we have to create an environment where everything has a common look and feel' (Ralph Poole, Director, responsible for technology applications that supported knowledge sharing).
- While substantial progress had been made in E&Y's approaches to knowledge management, significant challenges remained. Embedding knowledge in technology was an ongoing issue, with the technology options changing rapidly and the support requirements growing with increased use. It was particularly difficult to use technology to support some types of consulting knowledge—e.g. building relationships with senior client executives—which were tacit in nature and difficult to extract from the minds of practitioners.
- There were also issues remaining in terms of the culture for knowledge management and use. The E&Y consulting culture was traditionally based on pragmatism and experience rather than a conceptual orientation; while the culture was changing, there were many consultants who had entered the firm and prospered under the old model and found it difficult to aggressively pursue structured knowledge in systems and documents. The old culture had also placed a strong emphasis on highly structured methodologies, and the new approach was to provide more background knowledge to allow consultants to improvise an approach to suit the particular client situation. This was also a difficult adaptation for less conceptually oriented consultants. One key means for changing the culture was embedding knowledge orientation into the firm's performance-evaluation process; consultants were now evaluated in part on their contributions to and use of knowledge.

- Despite numerous attempts to measure the effectiveness of the knowledge management effort, E&Y knowledge managers felt that it was impossible to fully justify knowledge management investments and that some level of faith was required. In early 1996 the level of faith was quite high, and there was much anecdotal evidence of knowledge impact.

Results

At least part of the reason for the firm's improvement from static revenues in 1992 to a Big Six record-setting 21% in 1996 has been E&Y's knowledge-sharing vision.

By 1996, E&Y was building a consulting capability to help clients with their knowledge management issues, and had begun offering knowledge management consulting services to clients. This new practice area was called Knowledge Driven Business Consulting.

In 1997, it created 'Ernie', the online business consultant, in order to harness the experience of thousands of consultants to better serve a previously undeserved sector of the market—companies with \$200 million per year or less in revenue. Users—many of whom otherwise might not be able to afford E&Y's expertise—subscribe to 'Ernie', for approximately \$6000 per year and gain access to a detailed database of answers to common business problems.

Another benefit from the knowledge management initiatives at E&Y came in the form of a new image for the firm. The new vision for E&Y would be to go beyond the simple mechanics of technology to establish the foundation for an entirely new knowledge-sharing culture.

KPMG

Context

Over the last decade KPMG changed from a geographic and functional structural firm to a 3D matrix structure¹ to align itself with the clients' industry structure. This market-focused structure eliminated barriers to effective communication and it enabled the firm's professionals and consultants to develop in-depth knowledge of their client industries. The change programme also focused on internal processes, systems, and technology and their effective fusion. Redundancy was eliminated by designing streamlined common processes and developing shared services and product development. An important outcome of the change programme was the recognition and identification of knowledge management as a firmware process supported and promoted by senior management.

Goals

- To achieve competitive advantage by leveraging knowledge management as a core capability.
- To create a knowledge management environment that would, from a technical perspective, tie together legacy systems, and intranet, the WWW, data warehousing, document management, and new applications with networking and network management in order to give KPMG professionals ubiquitous access to the firm's brain trust.

Strategy

KPMG's senior management team believed that the key to any service organization's long-term success was the ability to leverage and deploy the knowledge of its professionals on demand. They perceived information technology to be an enabler of this process and viewed the embracing of technology and knowledge sharing as an important aspect of KPMG's cultural transformation. But in late 1996, KPMG was underinvested in technology and some of its Big Six competitors had a decided advantage in the area. KPMG's strategy was to turn its delay into an advantage by leapfrogging over their competitors using the new intranet and data warehousing technologies.

Culture

A core responsibility of the knowledge centres (see section on organizational structure) was the promotion and education on the knowledge management initiatives within the firm. A specific unit designated the Shared Knowledge Centre that had primarily responsibility for linking knowledge management with KPMG's strategy and senior leadership was also charged

¹The firm organized around:

1. Five lines of business (LOBs): Financial Services; Health Care and Life Science; Information, Communication, and Entertainment (ICE); Manufacturing, Retailing, and Distribution; and Public Services.
2. Functions (assurance, tax, and consulting).
3. Geographic areas.

with promoting a knowledge-sharing culture within the firm; participating in the development of firmware educational programs; and managing firmware knowledge management projects.

Technological infrastructure

In early 1997, Kweb, KPMG’s intranet-based knowledge management system, offered the following services:

- HTML/multimedia content publishing linking relevant and associated information to facilitate its access and delivery.
- Data warehousing services that provided easy access to the firm’s legacy systems (i.e. existing mainframe-based databases), initially targeting client, engagement, and employee databases.
- Powerful search and navigation tools that would enable users to quickly and efficiently locate information across different databases without having to use programming languages (e.g. structured query languages).
- Firmware access to the Internet for the collection of business content and communication with clients and others outside KPMG.

Organizational structure

KPMG proposed new organizational units referred to as ‘knowledge centres’ and a set of newly created roles and expanded responsibilities for some existing roles. These included the knowledge champion, knowledge master, knowledge integration manager, page master, Web master, and Web librarian. The role of knowledge champion was to establish leadership of and develop links between knowledge management and business strategy. The knowledge master’s role had a knowledge-sharing focus, that required high levels of expertise in subject. The role of knowledge integration manager involved the motivation, coordination, and management of projects across multiple knowledge domains, while the page and Web master and Web librarian were concerned primarily with content submission.

A knowledge centre was an organizational unit charged with core knowledge management responsibilities. Several knowledge centres needed to be established throughout the firm to support knowledge management at the local levels.

	Business processes	Technology
Generating	Knowledge and content creation were accomplished by collecting, synthesizing and interpreting related information from diverse sources (e.g. from internal and external reports or databases) as well as by distilling experience and lessons learned from client engagement projects. The later was empowered by integrating knowledge management processes with the firm’s business processes. Knowledge management was seen as a by-product of professional work rather than an add-on and additional requirements for the busy professionals.	N/A
Organizing	Indexing, filtering and linking, collectively referred to as library management activities, included the development of classification schemes and standards for screening and cataloguing content from both internal and external sources as well as the integration and interconnection of related content. Content management was ownership-based, with content created and contributed by a group (e.g. human resources or telecommunications practice) owned and managed by that group rather than centrally owned and controlled.	Knowledge was organized in nine knowledge domains: Competitor, Product, Employee, Engagement, Client, News, Industry, Practice, and WEB. Each knowledge domain was subdivided into additional categories. For example, the knowledge domain around KPMG’s clients and key targets (organizations that KPMG would like to have as clients) included: internal KPMG client-related information; client products, customers and suppliers; client organization; change dynamics; external client-related information; industry knowledge; and client financial performance.

	Business processes	Technology
Developing	Knowledge development and refinement was achieved through the application of the collected, captured and delivered knowledge by the firm's professionals. Application of knowledge in products and services delivered to clients ultimately brought new insight and further developed the existing organizational knowledge.	N/A
Distributing/sharing	The distribution phase for KPMG included the packaging and delivery of knowledge in the form of Web pages as well as the design of information displays, templates, and graphics and the creation of multimedia formats. Content was submitted in a single stream, but had multiple destinations. Rather than have all individuals in the firm add content directly, each group rather had a single input mechanism to the firm's knowledge base.	Kweb provided a single entry and access point to both internal knowledge domains and relevant external information sources. Access to the wide area network from remote or mobile terminals was provided through a toll-free phone number and smart security cards supplied to users. KPMG's wide area network was connected to the Internet through a firewall. Thus, Kweb users could access a variety of public and proprietary information resources directly on the Internet. Accessing the external Internet information resources through Kweb simplified access procedures by eliminating the need for additional IDs and for separate security administration and accounting for individual external content providers. For example Gartner Group's weekly analyst report files were imported to the Kweb environment.

Lessons learned

In a 1997 executive evaluation of the knowledge management strategy, three critical needs were identified:

- A process for large-scale cultural change.

Traditionally, KPMG had rewarded its professionals based on their individual performance and know-how. A major cultural shift was required to change their professional attitudes and behaviour so that they would willingly and consistently share uniquely held knowledge and insights.

- A mechanism for knowledge and intellectual asset assessment.

To effectively manage knowledge it was recognized that one must first delineate and measure it. What would be a meaningful metric for measuring the value, quality, and quantity of knowledge? How could the firm know whether the time, money, and energy spent developing, capturing, and sharing knowledge was justified?

- Robust technology and system implementation.

Firmware implementation of Kweb requires seamless, robust integration of three technological components—database management, communication and messaging, and secure browsing—on a very large scale. Two different technology approaches were available to KPMG. One which used emerging multivendor, best-of-breed components would require in-house software development to integrate the multivendor solutions, which would introduce innovation risks and delays that might in turn diminish organizational momentum. On the other hand, the option offered high levels of functionality and versatility in the execution of knowledge management. The second technical option involved adopting a single-vendor set of integrated information management, messaging, and browsing capabilities. Although more robust, the latter option was less flexible and less functionally versatile than the first.

Results

Not available.

IBM Consulting

Context

Since 1994, the IBM Consulting Group has employed the Intellectual Capital Management (ICM) effort as part of the company's reengineering project. The idea of ICM has been to institutionalize knowledge management and make it more formal throughout IBM Global Services and Global Industries. Its effort has involved taking practical steps to acquire, create, share, and transfer knowledge; use knowledge to continually develop and grow; and anticipate and adapt to changing conditions. The project has established a foundation for knowledge sharing and reuse at IBM by driving a consistent approach to intellectual capital management.

Goals

- To become more agile, innovative, and responsive to the demands of customers
- To capture customer data from internal and external sources and utilize the critical data and information in context in areas such as distribution, field services, customer service, inside sales and data mining for marketing and management.

Strategy

IBM's strategy for knowledge management comprised:

- Linking intellectual capital with strategy
- Building an infrastructure and processes for creating and sharing knowledge
- Creating a knowledge-based enterprise and culture
- Leveraging technology for global collaboration and knowledge sharing
- Measuring the effectiveness and value of intellectual assets sharing

Culture

IBM has established an enablement programme to drive community participation. Informal network structures are seen as conducive means to knowledge sharing and enhancement. These networks create a sense of fraternity and bonding. They aimed to provide a natural vehicle for obtaining insights, leveraging experiences, and optimizing reuse. IBM has institutionalized these informal network structures in order to minimize external management interference while maximizing internal team freedom to act.

Developing a knowledge-sharing culture was the most challenging issue for ICM. Developing a knowledge culture has been leveraged by addressing the following issues:

- Values and cultures
- Rewarding
- Shared mindsets and visitors
- Trust

Technological infrastructure

ICM AssetWeb, created by the ICM team, was a Lotus Notes-based collaboration system. The ICM AssetWeb contained three major features: (1) content management for valuing and structuring intellectual capital; (2) collaboration and teamwork to support community building and to energize intellectual creation; and (3) engagement configuration management to support a consistent methodology for amassing the best resources to use in generating client solutions. In addition, there was a strong demand to focus on customer knowledge management as the business adopting to customer-centric operation. The objective was to capture customer data from several sources both internal and external and utilize the critical data and information in context in areas such as distribution, field services, customer service, inside sales and data mining for marketing and management.

Organizational structure

Competency Networks—informal networks of practitioners—supported by common processes, tools, and other drivers aimed at enabling IBM professionals to create, identify, store, and reuse intellectual capital efficiently.

	Business processes	Technology
Generating	N/A	<p>Aiming at the linkage of creativity and idea generation with the daily activities of employees, ICM AssetWeb provided both discussion forums as well as an issue-based tool for structured collaboration.</p> <ol style="list-style-type: none"> 1. <i>Discussion forums</i> were seen as informal meeting places where ideas, comments, and thoughts are shared between <i>all</i> users. There are multiple forums available for users: Professionals' Forum is open to any topics, issues, concerns, or questions and there is no 'official' group controlling overview or providing answers. Competency Network Forum provided an arena to discuss issues relevant to the competency networks. 2. Issue-Based Structured Collaboration provided a common structure for virtual teams to work together to resolve critical issues. By using intuitive conversational terms, IBSC made it easy to classify elements of an ongoing discussion. <p>In addition Research Database, ICM AssetWeb's repository for business research provided consultants with information primarily from external organizations such as the Economic Intelligence Unit and the Centre for Information Systems Research at MIT.</p>
Organizing	<p>Intellectual capital was managed by competency networks. Each competency network maintained its own repository of intellectual capital that related to their competency and ensured the quality and usefulness of the information. Everyone was invited to contribute to any competency network database. Submissions went through an evaluation process to ensure that their content is in keeping with each competency network's goals.</p> <p>Intellectual capital at IBM consulting consists of software assets, competency intellectual capital and general intellectual capital. Contribution as well as requests for reuse of Software assets are made through Asset Managers.</p>	<p>The ICM AssetWeb categorized General Intellectual Capital into four partitions:</p> <ul style="list-style-type: none"> ● Research Database (described above). ● Best Practices Repository—was designed to provide information about leading practices, and the companies using them, for selected business processes. ● Market & Customer Information made an effort to provide a path for growth and value on market research and information on customer situations. ● General Intellectual Capital Repository—is a repository of information to which many practitioners openly contribute.
Developing	<p>IBM has implemented Asset Management processes which identify, harvest, and harden structured assets that have high potential in customer solutions.</p>	N/A

	Business processes	Technology
Developing <i>continued</i>	For example, in the Best Practice Repository knowledge is progressively improved from different engagement experiences and intellectual assets are generated through investment in harvesting and hardening.	
Distributing/sharing	N/A	Collaboration within competencies was facilitated by AssetWeb, a tool based on the Lotus Domino platform that provide versatile access via Lotus Notes or the Internet. The application provided Web access, navigation, enhanced search capabilities, and a structured framework for issue-based discussions. IBM's professionals could navigate through the ICM system to access the intellectual capital they needed. They could scan a summary page to see if it included what they were looking for. If it did, they could access the item, work with it, provide feedback, enhance it, team with others who had used it, and submit newly created items.

Lessons learned

Constant and systematic approaches of tracking successes as well as the real impact on business operations is critical to the long-term success of the programme. An organization needs to continuously understand these dynamics and consciously map strategies in their everyday tasks.

Having access to quality information alone is not sufficient for succeeding at knowledge management. Once intellectual capital is captured, institutions and practices must be established to compel its dissemination throughout the firm to increase productivity and foster innovation. Moreover, as companies expand to become more global, the assumed opportunities for spontaneous face-to-face exchanges of tacit knowledge diminish. These factors provide compelling reasons to create frameworks for unleashing what is learned at the individual level onto the organizational level.

Finally, the effectiveness and value of intellectual capital management depends on the active participation of each and every professional. Employees need to make it a habit to contribute their ideas and knowledge for reuse, and to attentively refine existing intellectual capital. Every knowledge domain should promote and encourage others to use and submit intellectual capital as well. Each employee's willingness to take the time to share their knowledge is critical. The time that one spends contributing will be more than compensated for when one taps the reservoir of intellectual capital to provide efficient, quality service to customers. Teamwork is key to the success of ICM.

Results

Through the implementation of intellectual capital management, IBM consulting:

- *Improved time utilization.*
- *Enhanced client satisfaction.* They were able to deliver the right solution to clients more quickly than before, by custom-tailoring solutions rather than creating each one from scratch.
- *Used resources more wisely.* Time saved in avoiding recreating solutions was used to develop high-quality proposals and improve the win-loss ratio.

McKinsey & Company

Context

In an increasingly information-and knowledge-driven age, the sheer volume and the rate of change of new knowledge made the task of knowledge development much more complex. In part because of these developments, McKinsey's client expectations of and need for leading-edge expertise were constantly increasing. In addition, the firm's own success had made it much more difficult to link and leverage the knowledge and expertise represented by thousands of consultants world-wide.

McKinsey had traditionally based knowledge transfer on personal networks. The company has started seeking ways to leverage and supplement this traditional means of knowledge transfer.

Goals

- To commit to the continuous development of the firm's professionals.

Strategy

Knowledge development had to be seen as a central not a peripheral firm activity; it needed to be ongoing and institutionalized, not temporary and project based; and it had to be the responsibility of everyone, not just a few.

Culture

A suspicion of anything that smacked of packaging ideas or creating proprietary concepts was in place. This reluctance to document concepts had long constrained the internal transfer of ideas. Building personal networks and internal reputations was of the utmost priority for the professionals. Efforts were made to align the knowledge management project with that philosophy. Senior management tried to convince the professionals that sharing their knowledge and experience with their colleagues would help enhance their personal networks.

Technological infrastructure

Available computer-based systems that support knowledge management included:

- A common database of knowledge accumulated from client work and developed in the practice areas
- The Firm Practice Information System (FPIS), a computerized database of client engagements
- The Practice Development Network (PDNet), a computerized system that aimed to capture the knowledge that had accumulated in the core practices of the firm.

Organizational structure

Centres of competence are built around existing areas of functional expertise like marketing, change management, and systems. The role of these centres is twofold; to help develop consultants and to ensure the continued renewal of the firm's intellectual resources. Recognized experts in each particular field are appointed as practice leaders, who are expected to assemble a core group of partners who are active in the practice area and interested in contributing to its development.

In addition, to ensure that knowledge produced within the centres of competence (as well as in already existing clientele sectors) was maintained and used each of these areas hired a full-time practice coordinator who acted as an 'intelligent switch' responsible for both monitoring the quality of data and helping consultants access the relevant information. The firm expanded its hiring practices and promotion policies to create a career path for deep functional specialists whose narrow expertise would not fit the normal profile of the generalist consultant.

	Business processes	Technology
Generating/developing	<p>The Practice Olympics were introduced to support knowledge generation. Two-to six-person teams from offices around the world were encouraged to develop ideas that grew out of recent client engagements and formalize them for presentation at regional competition at a first stage and firm-wide afterwards.</p> <p>At a different level, a number of internal assignments were initiated that were led by senior partners and focused on creating knowledge that was of importance to CEOs (e.g. the shape and function of the corporation of the future, the global economy, etc.).</p>	

	Business processes	Technology
Generating/developing <i>continued</i>	Finally, the McKinsey Global Institute, a firm-sponsored research centre designed to study implications of changes in the global economy on business, was introduced in an effort to create pools of dedicated resources protected from daily pressures and client demands, and focused on long-term research agendas.	
Organizing	A listing of all firm experts and key document titles by practice area had been assembled and was being updated regularly.	
Distributing/sharing	Major advancements of corporate intellectual capital that have generated new insights are being occasionally published in newspapers, magazines or journals. Practice Bulletins, introduced in the early 1980s, are two-page summaries of important new ideas that identified the experts who could provide more detail. These publications are not controlled through a formal mechanism. The philosophy behind them is to let the internal market sort out which of those are really big ideas.	

Lessons learned

Major infrastructure changes related to the knowledge management effort are prone to failure and require strong commitment from senior management. The role of the new class of consultant—the specialist—introduced to support the knowledge management effort has proved difficult to legitimize. The basic concept that a professional could make a career in McKinsey by emphasizing specialized knowledge development rather than the broad-based problem-solving skills and client development orientation never managed to be embedded in the firm's value system. The firm seemed uncomfortable about how to evaluate, compensate or promote these individuals. Furthermore, despite the newly introduced computerized systems, the knowledge management process still relied heavily on personal networks, or practices like cross-office transfers. Of the newly introduced 'knowledge management' concepts, those that blended best with the firm's philosophy were the most successful. For example, the idea of the McKinsey Yellow Pages, a listing of all firm experts and key document titles, found immediate and widespread use firm-wide because it was well aligned with the expert-based consultancy type of McKinsey.

Results

Not available.

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