By Decree or By Choice?
A Case Study

Implementing Knowledge Management and Sharing at the Education Sector of the World Bank Group

Elias G. Carayannis and Bruno Laporte

WBI Working Papers

By Decree or By Choice?
A Case Study

Implementing Knowledge Management and Sharing at the Education Sector of the World Bank Group

Elias G. Carayannis[1] [2] and Bruno Laporte[3]

World Bank Institute

[1] Associate Professor of Management and Technology and Director of Research, European Union Center, School of Business and Public Management, GWU, 202 994 4062, caraye@gwu.edu

[3] Mr. Bruno Laporte, Coordinator, Knowledge Sharing Program, World Bank, blaporte@worldbank.org.

Contents

Abstract

This case study identifies the elements of organizational change that were enacted within the World Bank to facilitate knowledge management and sharing, and in particular it focuses on the Education Sector Thematic Network knowledge management initiatives and outcomes. It also addresses the value added to the front line organizations responsible for the implementation of knowledge sharing.

An open question to which this case leads is about *the need for an assessment of the effectiveness of the knowledge management program in improving the capabilities of the operational staffs in particular World Bank regions through knowledge sharing institutional reforms and operational interventions.*

Another question is, "*Would the availability of better metrics have helped the implementation of the knowledge management program?*" The response is yes but of course the challenge is *to identify functional and effective metrics that serve a purpose and do not become the end rather than the means.* Overall, enduring questions that can be addressed only in the context of a continuous improvement process are:

- How can we identify, attract and empower more effectively and efficiently organizational change champions and knowledge catalysts?
- How can we better identify and corroborate the value proposition intrinsic in knowledge sharing initiatives?
- How can we design such initiatives so they are more sustainable and with longer term and broader scope impact?
- How can we better measure the value added by intangibles such as knowledge?
- How can we better manage and share tacit knowledge?
- What are ways and means to enable, catalyze, and accelerate sustainable knowledge sharing within and across organizations?
- How can best identify and replicate best knowledge sharing practices?

These questions could serve as an intellectual roadmap for the road ahead in further such studies of knowledge management, sharing and measurement within and outside the World Bank Group in which the first author is currently engaged.

1.0. Introduction: The World Bank Knowledge Management Initiative

In 1995, James D. Wolfensohn became the ninth President of the World Bank Group at a time when the organization faced growing criticism about the Bank's management and progress, from a number of stakeholders and partners, and particularly from the United States (its largest shareholder). In July 1996, Mr. Wolfensohn announced a "Strategic Compact" to reorganize and refocus the Bank's operations to improve its accountability, efficiency and effectiveness. Central to that initiative was Mr. Wolfensohn's plan to transform the World Bank into a "Knowledge Bank." As he pointed out, the Bank works on development issues with a wide range of stakeholders, including donor governments, non-governmental organizations, private sector and not-for-profit development groups, and borrower governments. This puts the Bank in a unique position to collect and redistribute knowledge about development. Mr. Wolfensohn's goal was that by the year 2000, the World Bank would be the first resource that anyone contacts for information about development. This case covers the time period from Mr. Wolfensohn's arrival through the target year of 2000 for accomplishing his objective.

Box 1: The Knowledge for Development Vision

The widening access to knowledge brought about by the knowledge and information revolution is transforming relationships between expert and amateur, government and citizen, aid donor and recipient. Knowledge cannot be static, nor can it move in one direction only. Instead, it must flow constantly back and forth across an ever-changing web, involving all who create and use it. This is no less true of knowledge at the World Bank, and of this Report. Even as we attempt to share what we have learned, we know that there is much we do not know. Nonetheless, we hope that this Report [World Bank Knowledge for Development Report, 1998] will help to increase understanding of the complex relationship between knowledge and development. And that this understanding in turn will help us better apply the power of knowledge to the great challenge of eradicating poverty and improving people's lives.

James D. Wolfensohn, President, The World Bank
July 27, 1998

One of the organizations within the Bank that experienced early success with this transition was the Education Sector. This paper begins with a discussion of the chronology of transforming the Education Sector into a knowledge-centric organization through the creation of distinct communities of practice, called Thematic Groups, and the implementation of an Education Advisory Service. This process and its results are evaluated in light of the implementation of knowledge management throughout the Bank in general. The paper concludes with some propositions about where and why the Education Sector's experience with knowledge management produced success, and the implications for other organizations attempting a similar revolution in how they do business.

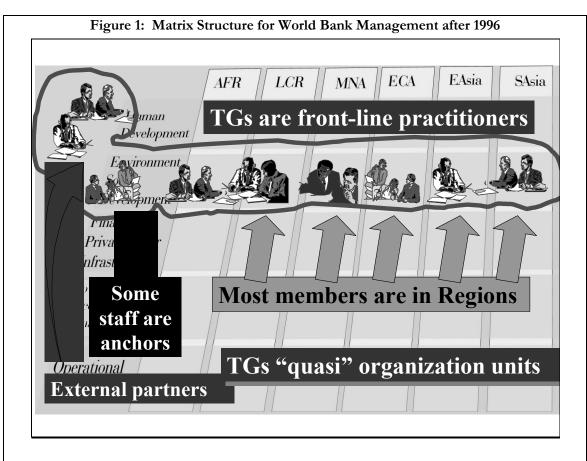## 1.1. Organizing the Knowledge Management Initiative

The roots of knowledge management practices at the World Bank can be traced back to a series of internal projects such as the Africa Live Database, a comprehensive and continuously-updated collection of economic indicators, toolsets and reference materials on development in the Africa Region. By 1995, the concept of 'knowledge management' was gaining currency in corporate management circles, spurred by numerous publications such as a series of articles in Fortune magazine on 'intellectual capital.' This process exposed more of the Bank's personnel to the benefits and strategies involved in knowledge management, which they then presented to other Bank staff throughout 1995 and 1996. Starting in 1997, the World Bank also participated in benchmarking studies on knowledge management conducted by the American Productivity and Quality Center.

During this time, Mr. Wolfensohn initiated a reorganization of the World Bank aimed at balancing and complementing the focus on geographic regions with an improved cross-sectoral, central coordination of Bank activities. With the help of McKinsey & Co and Arthur Andersen, the Bank developed a new matrix management structure initially consisting of five 'Thematic Networks' superimposed on the existing structure of geographic regions:

- Human Development (HD), focused on education; health, nutrition and population; and social protection.
- Finance, Private Sector, and Infrastructure (FPSI), focused on financial institutions and management; private sector regulation and competitiveness; and energy, transportation and other infrastructure.
- Environmentally and Socially Sustainable Development (ESSD), focused on environmental issues, rural development, and social development.
- Poverty Reduction and Economic Management (PREM), focused on economic policy, public sector management, gender and development, and poverty issues and services to the poor.
- Operational Core Services (OCS), the overhead function which provides services to World Bank operations.

Box 2: Thematic Groups Key Points

- The networks, each led by a Bank Vice President, were further divided into approximately 17 "sectors" spread across these networks. The "front-line" knowledge management work within and across sectors was conducted by "Thematic Groups" (TGs), staffed by core topic experts.

- The Thematic Group structure is **a socio-technical system** that formalizes communities of practice by combining both human and electronic networks. Through the Thematic Groups, or TGs, experts in specific knowledge domains relevant to each Thematic Network can interact to develop new knowledge products

- Thematic Group staff primarily retained their affiliation to a regional unit while fulfilling their Thematic Group duties while others were located at the center to anchor the Network.

- Thematic Groups also involved interactions with Bank "external partners," usually other private, public, and non-governmental organizations (NGOs), involved in development issues. By December 1999, there were already 123 Thematic Groups catalogued by the Knowledge Management Program.

Figure 1: Matrix Structure for World Bank Management after 1996

AFR   LCR   MNA   ECA   EAsia   SAsia

TGs are front-line practitioners

Human Development

Environment

Social Development

Finance

Private Sector

Infrastructure

Some staff are anchors

Most members are in Regions

Operational

TGs "quasi" organization units

External partners

Source: The World Bank Group (2000)

Legend: AFR: Africa, LCR: Latin & Caribbean Region, MNA: Middle East & North Africa, ECA: Europe and Central Asia

1.2. Foundations of Knowledge Management at the World Bank

One of the first challenges of the knowledge management initiative at the Bank was to compile knowledge resources that would contribute to field operations and projects, and then to convince Bank staff that sharing this knowledge would benefit both the Bank and its clients. On October 15, 1996, Stephen Denning (Denning, 1998; 2000) became the Program Director for Knowledge Management in the Office of the Chief Information Officer (this program was later transformed into Operation Core Services or OCS). He embarked on a campaign to disseminate success stories illustrating the benefits of knowledge management activities to Bank staff. His interactions with Bank staff indicated that while a substantial portion of the staff were receptive to the ideas and practices of knowledge management, the Bank also had ingrained cultural features where staff members preferred to keep knowledge to themselves and did not want to expose where they might depend on knowledge from other sources.

In the knowledge management concept document prepared by Arthur Andersen in cooperation with Bank staff, several principles for the new knowledge management system for the World Bank were identified. Some of the principles that the system was expected to follow included:

- **Necessary/Demand Driven:** The system had to provide resources based on the needs of the users and provide knowledge relevant to Bank operations.

- **Accessible:** Information had to be accessible on a just-in-time basis to all users, either through human intervention (an advisory services help desk) or direct electronic access.

- **Authoritative and Definitive:**   The system had to provide comprehensive information and knowledge on any topic, ensuring that a search for knowledge would produce an exhaustive list of results.

- **Inclusive:** The system had to accommodate participation by all users and ensure that it reflected the contributions of all users.

With these principles in mind, the Bank needed a way to create broadly-participatory but focused structures for sharing knowledge. The mechanisms for achieving this goal were the Thematic Groups and Advisory Services. Early in 1996, managers involved in knowledge management planning at the Bank and elsewhere began to recognize the importance of **“communities of practice”** in both generating and disseminating knowledge which eventually led to the formation of the Thematic Groups as shown in Figure 1.

A component of the Bank's overall approach was the creation of advisory services which functioned as help desks for the implementation and use of the knowledge management system.. The advisory services group was designed to be the hub or focal point of the knowledge management process. They were not the experts in the knowledge content. In theory, they would function as the junctions to match all incoming inquiries about a knowledge domain with the relevant community of experts.

2.0 Implementation of Knowledge Management in the Education Sector

"We are drowning in information but starved of knowledge"
John Naisbitt, Megatrends

The Arthur Andersen report recognized the importance of establishing a few, successful pilot knowledge systems in the networks to demonstrate the value of knowledge management to the Bank as a whole. In July 1996, the Vice President for the new Human Development Network, Mr. David de Ferranti, named the Education Department in his network as the pilot site for the development of a "knowledge management system." Mr. Bruno Laporte, the second author of the current study, who had been a staff member in the operational services area, became the lead manager in this effort. At the time, the Education Sector had approximately 250 staff assigned to it, consisting of both educational experts who developed research publications and other resources and education specialists who managed education-based development projects in the Bank's client nations. Mr. de Ferranti set a deadline of September 1, 1996 for implementing the knowledge management pilot—in other words, somewhere around 60 days to start the department on its transformation into a knowledge-based organization.

The Education Department was particularly suited to taking on this challenge. In 1995, a new Director had arrived at the Department, Maris O'Rourke. O'Rourke was something of an anomaly among senior managers at the Bank. First, she was not a career Bank official, but instead had been recruited directly from the government of New Zealand. In her previous position, she had overseen the complete restructuring and substantial privatization of the educational system of New Zealand. She describes herself not as an education expert but as a professional "change manager," with extensive experience in introducing organizational innovations in large bureaucracies.

One of O'Rourke's immediate observations was the gap between the core policy staff, based at headquarters, and operational staff in both the headquarters and field offices. The policy staff were primarily engaged in long research studies which produced authoritative books, which subsequently were not used systematically by the field staff. In her assessment, many of the policy staff had no concept that they were serving a 'customer,' produced content of limited relevance to operational work, and ignored topics that seemed to have obvious significance (such as girls and education, and educational technology). By 1996, she had negotiated a performance agreement with David de Ferranti. Essentially, she would be able to get the resources and management authority to remove unproductive staff and reorganize the department, predicated on meeting progress goals including implementing knowledge management.

O'Rourke and her team developed the **Education Knowledge Management System (EKMS)**, a program to address the lack of systematic learning from previous experience on education and development issues. The term "EKMS" was all encompassing of any initiatives or programs related to knowledge management. It was intended to develop a well-organized information and knowledge management system to remedy the problems created by the numerous disjoined databases and the sea of hard copy documents floating across the organization. It also was intended to bridge the rift between policy and research activities and operational needs at the Education Sector—primarily through capturing and reusing tacit knowledge.

The EKMS was a way of organizing to create, capture, distill and disseminate relevant development knowledge on education. In addition to the corporate memory of information, experience, and knowledge, the main goal for the EKMS was to include knowledge from outside of the organization. While the primary focus of the EKMS was to improve the effectiveness of education sector staff, through the provision of just in time and just enough knowledge to project teams, the ultimate goal was to meet the needs of both the Bank staff and its clients and partners.

Box 3: Knowledge Management Definition & EKMS Key Functions

- Knowledge management is **the collection of competencies and processes that help capture, process, diffuse and absorb critical corporate knowledge in an effective, efficient and timely manner.**

- Knowledge management can also be defined as: "**the systematic, explicit, and deliberate building, renewal, and application of knowledge to maximize an enterprise's knowledge-related effectiveness and returns from its knowledge assets**". [Wiig, 1997].

- Also, Sveiby (1998) defines knowledge management is "**the art of creating value from an organization's intangible assets**". Sveiby (1998) identifies two main tracks of knowledge management activities: one track focuses on knowledge management as the management of information and the other track as management of people.

Shortly after the knowledge management organization at the Education Sector was formed, in July of 1996, Maris O'Rourke with the assistance of a number of members of the knowledge management system team conducted a series of focus groups. This effort was also supported by Lesley Shneier from the Knowledge Management Program unit. O'Rourke and her team of collaborators wanted to find out what people needed to do their job better. The focus groups were designed to elicit the 'strategic themes' of knowledge that the Education Sector felt were essential to the organization's mission[4].

Across these themes, the Education Sector staff also specified the types of resources that they needed most to do their jobs. These items ranged from informal tips and ideas, to key readings and Bank reports, to directories of internal and external experts on education issues. These subject-specific resources would be supported by a set of more general reference and data sources, such as contact directories, past presentations and information packages, library-style reference documents, and statistical databases.

During 1997, Bruno Laporte and Stephen Denning conducted extensive "road shows" in the regions to establish support for the knowledge management program and the thematic group concept. They spent a considerable amount of their time with Task Managers, trying to educate people about knowledge management, dispel unfounded skepticism and inspire enthousiasm for the the potential of knowledge management within World Bank operations. They specifically introduced **"stories"** to explain how knowledge management works and to demonstrate the value of it to people in the regions (see Denning, 1998 & 2000). During this time period, the Education Sector completed the rollout of the Education Advisory Service and the Thematic Groups. By 2000, the World Bank Group as a whole, became recognized.

2.1. The Education Advisory Service

In November 1996, the Education sector launched the **"Education Advisory Service" (EAS)** as the gateway to the Education sector knowledge management program. All Bank education staff were invited to use this service as the first point of contact for any inquiries. The Education Advisory Service operated at first as a referral service for education related information knowledge and expertise. It was staffed by a single individual who began to design a means of keeping track of answers and building a knowledge base. Initially, this was a simple system built using the Microsoft Access database application, with little ability to translate the information directly into knowledge. As much time was spent managing the influx of questions as was spent getting answers. Later, staff of the EAS increased slightly, so that staff members could begin to specialize and share the workload.

This service was led by Martha Pattillo-Siv, a former librarian who was well versed in resources of both the Education Sector and the Bank in general. Ms. Pattillo-Siv proved to be a critical asset to the success of the KM initiative in Education. She provided a friendly and helpful 'point of entry' for clients into the Education KM system, and in many ways acted as the public image of that system. She also was very knowledgeable about identifying reference material and experts that were relevant to incoming inquiries, and thus demonstrated almost immediately the value of the KM initiative. For example, Ms. Pattillo-Siv knew from her experience in the library services area that the World Bank

---

[4] Nine strategic themes were identified: 1. Educational technology, 2. Economics of education, 3. Effective schools & teachers, 4. Access & equity in basic education, 5. Post-basic education & training, 6. Early child development, 7. Strategies for educational change, 8. Project design and implementation, 9. Private investments in education

had an all-electronic collection of its recent reports that was available to Bank staff. When she received a request for particular report, she was able to forward the document over the network instead of tracking down a hard copy and mailing it.

One of the earliest staff added to the EAS was a new employee, Kyriakos Georgiades. He brought several key qualities to the new service, in particular an affinity for information technology and Web authoring. As a result, Mr. Georgiades became the person primarily responsible for the interface between the EKMS and the Bank's Information Systems Group. It was extremely helpful to have someone who was directly involved in the work of the Education Sector, and also could translate the real needs of the sector into technical terms that the ISG could use as the basis of their requirements for the on-line system.

The technology for the first iteration of the on-line knowledge management system was an attempt at leveraging modern technologies, such as an open architecture object oriented methodology. At the same time, the Bank standardized on Lotus Notes as its primary contact management and personal productivity software suite. The problem which quickly became apparent to the Information Systems unit supporting the EKMS, **was how the system's design would inherently reflect the Bank's vision of the structure of its knowledge**. As a metadata model was defined, it became a sensitive issue and a source of gridlock. For example, debates broke out over what materials would be defined as 'knowledge' as opposed to 'information.' Although the entire effort was supervised by the Knowledge Management Board, a committee of senior Bank officials supporting Mr. Denning's efforts, there was no final arbiter who could resolve these debates and they were never fully resolved.

Since the knowledge management system was developed on the basis of multiple, rapid iterations (with a new version released every three months), the system architecture evolved independent of a clear strategic direction. At first, the system was highly centralized. As a result, groups which felt stifled by this centralized control (such as some in the Education Sector) learned HTML on their own and created their own knowledge portals, which could be described as 'knowledge shantytowns' sitting outside the formal knowledge management system. These independent systems ended up diverging in technology and structure to meet the diverse needs of their user constituencies. Only in late 1998 did the Bank finally develop an interface for its intranet and knowledge management system, resolving some of these conflicts.

The Education Advisory Service developed a successful tracking tool with the support of Mr. Georgiades. Also, the Advisory Services provided a human interface for tacit knowledge sharing guided by Martha Pattillo-Siv. By 1997, several newly created advisory services groups began to use the tool developed by the EAS. It was comprised of a common template in which people could fill in internal requirements. This freed up people to do work other then that related to technology. In July 1998, the Bank moved to an advisory services tracking system that enabled an email to go directly into the system as a ticket, immediately creating a record of each inquiry and enabling more detailed tracking of the success in closing knowledge requests.

One result of this process was that the EAS became a center not only for knowledge dissemination and transfer, but in a sense a nexus for knowledge generation as well. If an inquiry produced an answer that seemed particularly useful and might have application to future requests, the EAS staff would organize that answer into a 'knowledge nugget.' (Carayannis, 2001). This document was a partially-processed representation of the question and the resources to answer that question.

As one important driving force in this new knowledge resource, Martha Pattillo-Siv never saw the EAS as a simple help desk. Instead, she designed the service to be more similar to a consulting firm, facilitating contacts between outside staff and the Education Sector experts. **In her view, the**

EAS should not be a 'shelf' where static documents were located, but more of a true 'advisory service' (hence the name) which helped customers to find the answers they needed. For example, this could be the case in connection with the due diligence undertaken in preparation of a mission, as well as during a mission and in order to provide post-mission support and help with preparing back to office reports. In the overall analysis, setting up the EAS concurrently with the Thematic Groups proved critical to building the support needed to push implementation of the Thematic Groups.

2.2. Two Early Thematic Groups: Economics of Education and Early Child Development

As mentioned earlier, Maris O'Rourke and her team resolved to implement the Thematic Groups in the Education Department on a staggered schedule. A series of focus groups were held which eventually included the participation of almost all Education staff. The staff were asked to choose which topics in education were most crucial to the Bank's activities and nine basic themes were identified: educational technology; economics of education; effective schools/teachers; access and equity in basic education; post-basic education and training; early child development; strategy for educational change; project design and implementation; and private investments in education. These themes remained stable and are the basic set of TGs in operation at the Education Department today. Two typical and successful early TGs were the ones focused on the economics of education and on early child development.

The economics of education TG was led by Harry Patrinos, an economist with extensive experience in the economic analysis of education programs. Patrinos was in a rather unusual position as an educational economist. Most education specialists were very wary of economists, and seemed at times to view them as hostile. At the same time, economists typically looked down on the education staff, since finance and economics held somewhat higher standing in the Bank's organizational culture. The economics of education TG played a critical role in the success of KM at the Education Department, because it helped to bridge this divide.

Patrinos realized that to win over the staff who viewed knowledge management as just another management fad and a waste of time, his TG would have to focus on quality rather than the quantity of knowledge available. To ensure the relevance of content that had previously gone lacking in Education Department studies, he directed his core team (consisting of one other full-time staff member, plus an 'advisory group' of four experts) to develop first toolsets, training materials, and descriptions of 'best practices' in the economic analysis of education. As his core team was composed mainly of practitioners rather than theorists, they were able to identify and develop content for the Web site which was very applied and instantly useable by field staff. In fact, the team ended up eliminating much of the content first proposed for the site to ensure that every resource made available would be of maximum relevance. This contradicted the original performance measurement system for the EKMS, which tended to reward quantity of materials posted rather than usage.

Technology proved to be somewhat of a hindrance rather than a facilitator for organizing the knowledge resources of the TG. In order to enforce the principle of standardization across the World Bank knowledge management systems, Patrinos and his team were directed to rely on the central Information Solutions Group for actually publishing the content that they had developed on the TG Web site. The Information Solutions Group staff was overworked trying to manage the implementation of this new system, and could not always respond immediately to the needs of each TG. Also, Patrinos found the system to be very rigid and focused more on technical sophistication

rather than content and ease of use. The TG staff eventually took the time to learn HTML publishing themselves so that they could post content without going through the central IS group.

Patrinos also took advantage of opportunities to leverage outside resources in building the knowledgebase for his TG. Instead of focusing his recruitment efforts on operational staff, who were often too busy with their own projects to develop content for the TG, Patrinos was able to buy or trade the time of consultants used by the Bank. As part of that effort, the TG's core members conducted a knowledge assessment to identify significant gaps in the group's knowledge resources, and to identify consultants who could fill those gaps. Patrinos also worked with outside expert organizations, such as economists at the University of Illinois at Chicago, to post their content on the TG Web site.

In the case of the early child development TG, Ms. Mary Eming Young was already well-connected among experts in the field outside of the Education Department, having been a specialist in the public health organization of the Human Development Network. From the beginning, she envisioned her TG as simply a gateway or portal to the vast amount of existing resources on the topic of early child health and education. She had begun her own independent effort to synthesize the knowledge in this field in 1994, and so she already had exactly the expertise needed to lead the Thematic Group.

The early child development TG actually launched its Website in May of 1996, before many of the other TGs had even been organized. It was different from other Education Department TGs in that both the contributors and users were primarily from outside the Bank. Mary Young made an early effort to create a virtual network of contacts she called "Friends of Early Child Development" with very large participation from external partners. These interested parties periodically communicated on-line to help establish their interpersonal contacts and to plan for the development of the TG. Even much of the funding for the TG's activities was provided by external sources. As a result, Mary Young had more managerial flexibility over how she organized the TG, as she was not completely tied to an internal management structure for resources.

In the case of this TG, the external funding was helpful because Mary Young did not feel that the Bank's mandated knowledge management framework was appropriate for building the kind of portal she had in mind. Most of what she and her small team developed was more similar to an annotated bibliography with links to external sources of knowledge, rather than an internally-stored library. This made the development of the TG's Web site less complex, meaning that the TG did not have to rely on internal information systems staff to publish their content. At the same time, this was a slight drawback in that many external sources used Web sites which were more graphics-intensive, which often taxed the low bandwidth and technology available to Bank clients in developing nations. The reliance on external experts was also helpful, since the core staff for KM activities were generally more junior staff who had good technical abilities but lacked in-depth knowledge about the field. Still, Mary Young found that it was always a struggle to obtain original content from outside sources.

Eventually, without major funding, the early child development transitioned into a "maintenance" mode, with a research assistant continuing to check for obsolete links and provide occasional updates. The TG could use some additional funding, as Mary Young is most concerned about 'stale content' as the field of early child development continues to progress. Still, the TG has achieved many of the objectives set for itself. It has helped to raise awareness of early child issues among lending officers and project staff; it has helped project staff to integrate early child development programs into their activities; and it has created a virtual community of practice within and beyond the Bank that continues to foster active participation and interaction.

2.3. Measures of Progress in Knowledge Management Reforms

The Education Advisory Service was focused on and assessed by its ability to respond quickly to its clients' information needs, whereas the Thematic Groups were assessed by their ability to support a given project team's efforts by developing relevant and timely content and providing them with advice.

Some of the thematic group leaders were very effective, while some were slow to understand and were replaced. They were required to be good communicators. Thematic groups leaders had to understand the vision and utilize contacts within and outside the Bank. They understood that they had to build a body of knowledge. Having the right thematic group leader was as important as having the right style of leadership. The best ones were not necessarily the top people in their field. Having the ability to connect was critical.

One early measure of success of a thematic group was a tacit sense of success—the idea that "you know it when you see it". They had to assemble a community of people who could cooperate and share knowledge. They created a set of related partnerships so that knowledge being put on line was co-sponsored within and outside the institution. This required an extensive outside network of people and institutions with which to work.

A more specific measurement for the TGs a count of the number of visitors to the websites both from inside and outside of the Bank. This was an indication that the initiative was providing links among people that would not have existed with the TGs.

Some policy staff were very good at developing tools from the perspective of the task managers on a project understanding what they needed. This included analysis methodology to justify intervention and implementation manuals to define the steps that needed to be taken. The first phase was for the thematic groups to synthesize and share knowledge. There is an implicit assumption that there is a link between knowledge and quality. The second phase was to capture what the groups were specifically doing and how much value they were adding to the front line. Pressure was put on thematic groups to respond to exactly what tools and knowledge was required by the task managers. This as a factor in the measurement of reduction of cycle times.

3.0. Assessment of the Implementation of Knowledge Management in the Education Sector: Comparisons Using External Benchmarks

---

The implementation of knowledge management at the Education Sector, from its initial pilot stage through the roll-out of KM across the Bank, is regarded by many principals involved in the process as a successful example of organizational change. Knowledge sharing is now a well-accepted and naturally-occurring mode of doing business in the Education Sector. Even those staff who do not actively engage in knowledge sharing can benefit from its results, absorbing the knowledge which flows through the Thematic Groups and the Education Advisory Service. This activity is tracked by periodic 'user surveys' of the Education Sector staff, indicating in what capacities they contribute knowledge to the Education Sector's knowledge management programs, and what elements of the programs (the Advisory Service, TGs, etc.) those staff members use as part of their duties.

Another data point in assessing knowledge management at the Education Sector is an analysis of Bank-wide knowledge management effort, conducted in early 1999 by a group led by Larry Prusak of

the IBM Institute for Knowledge Management. The report concluded that the Thematic Groups were indeed **the "heart and soul" of Knowledge Management and Sharing at the World Bank** but it also noted that their potential was not fully realized for the following reasons:

Box 4: Knowledge Management Challenges at the World Bank

- The overt knowledge tasks of thematic groups, particularly capturing and disseminating know-how, often seem to the practitioners as an adjunct to their work and therefore burdensome…

- Outreach to task teams is uneven…Interviews with task managers show that many staff would make important contributions to the Bank's knowledge base, with a minimal incremental effort that would make it easy for them to make such a contribution, e.g. video interviews.

- The challenge of incorporating external partners into the thematic groups will further aggravate the stress on the thematic group leaders…

- Even the best thematic groups are fragile entities, usually dependent on the presence of an exceptional individual who has "emerged" but who might just as easily disappear…

- It is inefficient for TG leaders to devote scarce time to day-to-day administrative, logistical and communications tasks involved in making a TG successful…As communities of practice grow and are electronic, more consistent maintenance/stimulation of the network is needed.

- TG leaders are hard pressed for time. More budget or other incentives won't help much, since the TG leaders are already trying very hard, but are simply short of time to meet all the challenges they face.

Source: (Prusak, World Bank Knowledge Management Assessment Report, 1999)

In comparison, the Education Sector TGs by 1999 had already overcome many of these challenges. Most of the TGs, especially early examples such as the Economics of Education and Early Child Development TGs, had stable leadership and strong participation from staff throughout the Education Sector and beyond. These groups had developed into communities which were in large part self-sustaining, thanks to continued contributions from TG members and external partners. Even in the face of budget cuts in FY2000, many Education TGs were able to survive thanks to outside sources of funding and internal innovations. Also, a cadre of strong TG leaders including Harry Patrinos and Mary Eming Young had emerged. This vanguard of experienced TG leaders were able to transfer their experiences to other groups within and outside the Education Sector.

A primary indication that the Education Sector made effective use of its knowledge is the culture of organizational innovation and entrepreneurialism that was fostered partly as a result of knowledge management and sharing initiatives. For example, in the late nineties, the World Bank sponsored **a 'Development Marketplace'** where groups were encouraged to submit applications for special funding grants, supporting projects related to knowledge management. Despite its relatively small size, the Education Sector won a significant number of grants, showing

that the organization had learned from experience how to make knowledge management work for its clients. The Education Technology and Private Sector in Education groups benefited significantly from these grants.

The people we interviewed do not try to claim that it is an unqualified success. While knowledge sharing is an acknowledged part of the operations of the Education Sector, they stop short of stating that knowledge sharing is thoroughly ingrained in the organizational culture of the Bank. Still, it is clear that the Education Sector staff understand that knowledge sharing is expected of them, and they often rise to the task. **What accounts for this comparative success of knowledge management at the Education Sector, especially when similar attempts elsewhere in the Bank were less successful?**

3.1. What Were the Key Success Factors in Knowledge Management and Sharing

Although the Education Sector Knowledge Management and Sharing initiative was overall successful, there were areas of resistance. They were typified by people who felt threatened by the changes or were apathetic towards knowledge management. Other forms of resistance were expressed by statements such as " the techies are doing stuff with the internet". Some claimed to not know the objective of knowledge management and looked at it as a waste of resources or as a fad, costing the World Bank a lot of money. They could not comprehend the future benefits. This is where the advisory services team played an important role in the area of communications and personal engagement. In other words, three important functions were served by the EAS:

- Communication (of key issues and education of key people)

- Co-optation (of key players and internal champions of knowledge management and sharing)

- Co-ordination (of key activities and resources for the implementation and support of KMS)

Box 5: Knowledge Management & Sharing Critical Success Factors: Insights from Arthur D. Little

When an organization attempts to understand **what knowledge it is generating, how to capture it, and how to go about easily disseminating it, all of the activities should be tied to strategic objectives.** One needs to know what is being done, how well is it being done and how it can be improved upon. These are not rhetorical statements. Many companies do not have a section on knowledge management in their corporate strategy. Most do not have a section on intangible assets overall. The business world is at the very beginning in dealing with these items. The market place is nascent at this point at best, and there are tremendous opportunities for people to think differently about how they do corporate strategy. **Knowledge management and human capital management are the most important items on which to concentrate in terms of corporate strategy, but is key that one think about knowledge management within the context of its human and not only technological aspects.**

Tony Hamer
AD Little July, 2001

A number of factors seem to show how the nature of the TG implementation process at the Education Sector Thematic Network led to a successful perceived outcome:

Organizational sponsorship. Education was the pilot for KM, and therefore had the support of top Bank officials including David deFerranti, Vice President of the Human Development Network. The role of the Education Sector Board was crucial in supporting and catalyzing this effort, especially in getting the support of regional leaders as well as Development Economics Committee (DEC), Quality Assurance Group, the World Bank Institute (WBI), etc. David deFerranti in particular, engaged in a very effective "road show" for getting up the Networks and for focusing on five specific output categories as opposed to inputs. These outputs were Strategy, KM, Quality Assurance, Staff Training and External Partnerships and were adopted by Ms. Maris O'Rourke. O'Rourke also adopted the "let a 1,000 flowers bloom" philosophy and this encouraged and energized the regional leaders to propose and implement new TG ideas.

Also, Stephen Denning accompanied Education leadership on their 'recruiting' trips to the regions, giving greater visibility to those efforts. On one hand, this meant that the Education TGs 'were not allowed to fail,' even in cases where failure might have been more constructive. On the other hand, strong executive support and buy-in clearly made it easier to marshal the resources to make the TGs effective.

KM & TG leadership. The Education Sector had a strong leader supporting the TGs, and each successful TG had a founding leader who was able to see the group through the critical start-up phase. Maris O'Rourke was commonly cited by TG leaders as a critical success factor in and of herself, as she pursued a management strategy of staff empowerment and constructive engagement with the knowledge management effort. Her leadership provided a model for how the TG leaders approached their own efforts to establish and manage the thematic groups. This leadership supported a constructive and trusting workplace environment which valued personal initiative and innovation. Maris O'Rourke was also committed to 'running interference' between her staff and external critics, enabling them to undertake the formation of the TGs without outside interference or impediments.

Access to resources. The Education Sector backed its TGs with some real resources, particularly dedicated staff and limited budgets By 1998, each TG received an average of $250,000, enough to fund the time of the TG leader and a research assistant, plus commission the development of customized knowledge products. Thus, these TGs could create their own content and invest in infrastructure and knowledge organization tasks. More importantly, these resources were somewhat limited, forcing the TGs to think strategically about the knowledge resources that they needed to develop and supporting an emphasis on quality over quantity.

Nature of the education field. Education is a fairly tight-knit community, with strong bonds among members of the field at the World Bank and recognition across the Bank of the importance of education in development. At the same time, the education area has less prestige in the organization than fields such as economics and finance. This engenders a culture within the education field where members support each other and are generally strongly committed to their field, even against external pressures. This culture was very helpful in enabling the Education Sector to push its knowledge management agenda, even against strong criticism.

Division of labor. All Education TGs had a common 'help desk' service, led by Martha Pattillo-Siv for many years. This gave all TGs a common 'face' to their activities for outside users, and also assigned the first responsibility for contact with outside clients to one person and her immediate staff. This enabled the TGs to work more intensively on developing their internal dynamics and resources, instead of constantly fielding inquiries from customers.

Nature of KM staff.   Another key factor in the speed of change within the Bank was the availability of a core group of people who were experienced knowledge sharers. These people are typically younger than most of the people in the bank and understood technology. This was different than rest of bank. They experienced a sense of innovation and were having fun while being productive. In addition, they were passionate about the work and creative in how they went about accomplishing it. They were successful in getting grant money from outside sources for many of the groups, supplementing the budget given to the thematic groups at the institutional level. This community of practice of information professionals unleashed the ability to share within thematic groups.

Communication strategies.   Management conducted extensive "road shows" in regions to drum up support for the knowledge management and the thematic group concept. This was done mostly to bust myths about knowledge management but also to solicit participation in the thematic groups. Presentations introduced the first "stories" to explain how knowledge management works and to demonstrate the value of knowledge management. These 'SWAT team' tours to the regions by management ensured that every one got the message. The promotion of the effort by others than the educational group gave support to the Education Sector initiative and brought a better understanding as to why the Bank was going through the process.

Strategic recruiting efforts.   The process for recruiting people for a thematic group was an example of a successful approach. The intent was to get people to identify with a thematic group. It was accomplished by using a three tier system. The first relationship was the core leadership group which consisted of a thematic group leader and the assigned staff. The second component was the advisory group of six to twelve people with an expertise based upon a particular theme. The final component consisted of thirty to one hundred other people who were interested in using the knowledge and contributing to the subject area.

Ability to develop outside relationships/sponsorship.   Some Education TGs, such as Economics of Education and Early Child Development, created critical and lasting relationships with outside organizations, such as universities and other NGOs. This gave those TGs a wider audience, a strong base of support among Bank clients, and more resources for the TGs' own activities.

Content development and integration.   Successful Education TGs developed toolkits, knowledge 'nuggets,' and other useful packaged content that was easily integrated into project work in the field.

Strategic location.   One early development was that the Education knowledge management team, including the EAS, was moved to an open and flexible office space located near the office of the Director of Education. The location itself conferred both prestige and visibility for the group. It also helped morale within the team. There was an intangible value in a having warm human contact to whom to turn over questions with the understanding that a response would be forthcoming. The space also helped the team to develop a 'human touch,' with Martha Pattillo-Siv greeting most visitors to the office and Maris O'Rourke frequently circulating to talk to the staff. This made both clients and internal employees feel more at ease and comfortable with their duties.

Setting and managing clear expectations.   As part of her role as Director of the Education Sector, Maris O'Rourke was very candid about requiring her staff to contribute to knowledge sharing and to apply internal knowledge to the tasks of the organization. She admits to being rather strict about encouraging uncooperative staff to find new positions in other parts of the Bank. In 1999, participation in and contribution to knowledge sharing became a key criterion for formal personnel evaluations, providing even greater incentives for staff to demonstrate their commitment to the concept.

At this juncture, it would be helpful for the reader to consider if there might be some other critical success and failure factors and lessons learned that can be identified from the discussion so far and also relate to their own particular organizational context and experiences with knowledge management and sharing initiatives for additional insights.

4.0. Is Knowledge Management Truly "Successful" at Education?
A Discussion of the Literature and Empirical Findings from the World Bank Education Case Study

---

The increased use of the World Wide Web and the associated volumes of data has led to the increasing importance of the management of information as an asset. Corporations have to decide if the payoff is greater by sharing information or hoarding it. The traditional approach is to protect information. This assumes that there is some perceived value in being in sole possession of the information. Of course it is becoming increasingly more evident that sharing information with customers and suppliers can often be beneficial.

Stephen Denning (1998) defines **knowledge management as the process for knowledge sharing**. He also provides a distinction between information and knowledge: **Information is defined as data arranged in meaningful patterns, while knowledge is an idea or fact that is believed and is reliable.** He states the World Bank can better accomplish its mission by maintaining a focus on indigenous knowledge which is the traditional know-how that exists in all societies. He also states the key dimensions to a knowledge program:

1) Knowledge management programs have dimensions of collecting and connecting

2) Knowledge management programs include social processes by which communities of practice enable knowledge sharing to take place

3) Knowledge management programs support the maintenance of beneficial external partnerships

4) Knowledge management programs use information technology to assist in knowledge creation and knowledge use in addition to the most common aspect of supporting the dissemination of know-how

Knowledge sharing became a term that was deemed more appropriate to capture the organic nature of knowledge communications. **This process is highly non-linear and interactive, influenced, catalyzed and/or impeded not only by the technology at hand but also the people involved and the underlying culture.** Various technologies can be used to capture and communicate knowledge such as best practices or decision- making techniques. But it may well be that knowledge sharing takes place more naturally and readily in a "peer to peer" fashion, that is between and among people of similar skill sets, expertise, experiences, and task responsibilities and even with cultural and professionally affinities. Divides of many kinds, technological, cultural, professional, and organizational tend to hinder knowledge sharing, absorption and use.

The need for sharing knowledge does not necessary stop at organizational boundaries. An organization can improve its knowledge management by the inclusion of the expertise possessed by its customers, its suppliers, its complementors and even its competitors. Grouping these people into communities of practice and providing a technological infrastructure for sharing knowledge is one effective way of addressing this issue.

The Education Sector's implementation of knowledge management was influenced by Stephen Denning and therefore reflected the elements of success as he describes them. There are other theories that can be used to assess their effectiveness. For instance, the Institute of Learning has synthesized seven principles of learning:

1) Learning is fundamentally social

2) Knowledge is integrated in the life of communities

3) Learning is an act of membership

4) Knowing depends on engagement in practice

5) Engagement is inseparable from empowerment

6) Failure to learn is a common result of exclusion from participation

7) We already have a society of lifelong learners

The first principle addresses the relationship between social fulfillment and learning. Learning is enhanced by integration within the social environment of individuals and organizations. In the World Bank this principle is supported by implementation of a holistic approach to development. This approach is interdisciplinary in nature, taking into consideration economic, social, political, and technical implications in the execution of development projects. The cognitive and organizational "glue" that enables this holistic approach consists of knowledge sharing tools and methodologies as discussed in this case study.

These principles are independent of technology and a technological infrastructure. Their applicability to the Bank's business situation can be attained without respect to the tools involved in the implementation. The Bank has adhered to the remaining Institute of Learning seven principles by the development of Thematic Groups and other processes. Thematic Groups have been identified as the heart and soul of the World Bank efforts. The principle behind the formation of the affinity groups is to provide a forum for socialization among people with similar expertise. The objective of this socialization is knowledge sharing among the various communities.

Knowledge within the World Bank is not created solely within an academic setting. In addition to being a product of the rigors of research, the majority of the Bank's knowledge base is actually acquired via the execution of development projects. This is consistent with the principle of knowing by engagement. The individuals within the organization enhance their knowledge and expertise by working on various projects often having similar characteristics but in totally different environments. These new situations force the individuals to be adaptive and add to their knowledge.

Although the World Bank shares knowledge on a world-wide basis, each region has management autonomy. This is an important ingredient in the learning process as individuals must participate in order to learn. This autonomy provides opportunities for members of departments to be engaged in truly meaningful role since their decisions and actions have direct, significant and visible

consequences on the outcomes. This situation not only increases the opportunity for learning itself but also creates an environment to enhance the quality of learning and creation of new knowledge.

The World Bank can better accomplish its mission by maintaining a focus on indigenous knowledge, that is the traditional know-how that exists in all societies, combined with and complemented by experience-proven expert knowledge. However, this seems to sometimes have come rather as an after-thought rather than as a policy driver. One very effective way of informal knowledge management and sharing can be considered to be **story telling** that serves as a means to capture the cumulative experience and wisdom of communities of life, practice, and interest and to transfer that experience and wisdom in a way that achieves good knowledge "impedance matching" in a cultural and cognitive sense. In other words, story telling provides people with critical information and knowledge in a way that is non-threatening and recipient friendly, almost subtly transparent, achieving the sharing of insight and even gestalt-switch (the Aha! Moment) by immersing the listener in the experiential context, content and process of the story weaver and possibly the story teller.

Story telling could be considered one of the oldest – if not the oldest – socio-technologies developed , diffused, and adopted by humans (Carayannis, 1999). Story telling may well have enabled Homo Sapiens to survive and prosper in transitioning from the Cro Magnon who were sharing knowledge by carving pictographs on cave walls to today's "wireless business warriors". Story telling can thus be seen as the catalyst and accelerator of the process of knowledge transfer, sharing, and absorption as well as knowledge management by helping access, revise, and update the informal stocks of knowledge and know how as well as the formal, codified bodies of information, knowledge and expertise (Carayannis, 1998):

> The knowledge creation, transfer, selection, acquisition, storage, and retrieval processes can be viewed from an *information theoretic* (Shannon & Weaver, 1949) and a *meta-cognitive* (Simon, 1969; Sternberg & Frensch, 1991; Halpern, 1989) / *linguistic* perspective (Chomsky, 1971, 1993), where the human problem solver and technology manager is seen as both a technician and a craftsman (Schon, 1983), a "lumper" and a "splitter" (Mintzberg, 1989). Individuals, teams, and organizations rely on *multi-layered technological learning and unlearning* (Carayannis, 1992, 1993, 1994a, 1994b, 1994c, 1994d; Dodgson, 1991, 1993) to create, maintain, and enhance the capacity of individuals, groups, and organizations to transfer and absorb *embodied* and *disembodied* (von Hippel, 1988) technology in the form of *artifacts, beliefs*, and *evaluation routines* (Garud & Rappa, 1994) and *tacit* and *explicit* knowledge (Polanyi, 1958, 1966; Nonaka, 1988, 1994).

Story telling, may also serve to convert tacit to explicit knowledge by helping articulate tacit insights and formulate them into explicit findings that shape policies and actions (Nonaka and Takeuchi, 1995):

<table>
<tr><td colspan="3">Box 6: Converting Knowledge from Tacit to Explicit</td></tr>
<tr><td>Knowledge Conversion</td><td>Tacit Knowledge   TO</td><td>Explicit Knowledge</td></tr>
<tr><td>Tacit Knowledge
FROM</td><td>Socialization
(Sympathized K)</td><td>Externalization
(Conceptual K)</td></tr>
<tr><td>Explicit Knowledge</td><td>Internalization
(Operational K)</td><td>Combination
(Systemic K)</td></tr>
</table>

4.1. Has the Education Sector Made Effective Use of Its Knowledge?

An intangible benefit of a well implemented knowledge management process is more efficient and effective employees through the availability of needed information. Having access to information is the precursor to effective use of the information, however, availability of information does not necessary lead to its effective use.

It is this effective use of knowledge that directly results from successful implementation of knowledge sharing programs that help employees cope as they are bombarded with information in pursuit of knowledge. This everyday reality in most "knowledge-based organizations, the World Bank included, results from a number of reasons:

- frustrations in sorting out pertinent information,

- the lack of time to digest the information, and

- having too many sources from which to obtain the same information leading to confusion and inconsistency.

When effective, knowledge sharing programs can substantially alleviate the problem associated with information overload.

Effective knowledge sharing programs provide processes to help individuals obtain the correct information when they need it. **Individuals should spend more time focusing on solving specific problems than on weeding their way through documents or databases so that they have the opportunity to more effectively utilize the knowledge that they gain. The key to understanding how effectively knowledge is being used is the determination of what to measure.** Effectiveness in knowledge management and sharing, can be measured in terms of:

- output,

- productivity and/or

- quality.

Once it is determined which aspect is most important to a particular case, such as the Education Advisory Service, where high quality solutions were provided quickly to internal World Bank clients, another criterion of effectiveness is one of **perspective**. Namely, **should effectiveness of the use of knowledge be measured from the perspective of the recipient of the knowledge or from the perspective of the customer of the recipient of the knowledge?**

The power of knowledge sharing is to enable, catalyze, and resolve in a timely and effective manner, dealing with outstanding questions and issues. It can also trigger **strategic serendipity** (Carayannis, 2001) in knowledge generation, diffusion and absorption, namely, it can catalyze and support an environment of participant and interactive learning and discovery. Strategic serendipity in essence includes not only an orchestrated process of knowledge sharing but in particular a spontaneous and serendipitous process of discovery and learning of the unexpected and the non-apparent. It is manifested into successive cyclical transitions that transcend four stages of awareness (**Stage IV: ignorance of ignorance, Stage II: awareness of ignorance, Stage III: awareness of awareness, Stage I: ignorance of awareness**) (Carayannis, 1998). These stages layer on top of one another to form **an individual and organizational cognition spiral** (ibid). We call this serendipity strategic, since, albeit it is hard to quantify and anticipate, it may indeed prove capable of adding

substantial, unique, and essential value to an organization that could not have otherwise been realized (Carayannis, 1998, 1999, 2001).

Strategic serendipity can be a powerful driver of effective and efficient knowledge management and sharing when combined with other good practices such as effective knowledge measurement and enlightened top management support to foster a culture of trust and openness rewarding calculated risk-taking. Under these conditions, there is a happy convergence of people, technology, and culture that enables the formation of robust knowledge management and sharing practices and institutions. However, absent enlightened top management support and/or having a weak trust and limited openness in an organization, strategic serendipity becomes inaccessible and powerless.

5.0. Lessons Learned and Implications for Other Organizations

It takes 3000 ideas to equal one commercial success.
The validity of this statistic places a premium on the management of ideas
Greg A. Stevens and James Burley

The World Bank and specifically the Education Sector seem to have been effective in their efforts to institute and catalyze knowledge management and sharing practices by engaging in a balanced deployment and leveraging of **the three key drivers in organizational change and renewal: people, technology and culture** (Carayannis, Summer 2001). In other words, they succeeded in creating the proper incentives and culture for people to participate in knowledge sharing and also provided **the enabling infrastructure** to do so, as well as diffused the requisite shared vision for this initiative and its payoffs. This was a process that was empowered and catalyzed by a drive from the top of the organization. Top management made it obvious that knowledge management & sharing were a part of the **strategic compact** of the organization. A tangible manifestation of this drive was **the budgets** that were assigned in a way that facilitated the necessary changes in the organization. It paid both literally and figuratively, for the Thematic Group leader, and personnel to assist their internal knowledge clients. The staff was evaluated on what they had done to contribute to knowledge and learning. Finally, the **communication of success stories** raised the visibility of the themes to the entire organization. None of the above incentives can be singled out as being most important, however, collectively, they were instrumental for the success to date.

Senior Management Support: Top Champions and Visionaries

The President of the World Bank as well as the VP for Human Development Network and the Director of Education were visionaries who served as the idea champions and change agents. They all wanted knowledge sharing to be a major part of the Bank activities and therefore "volunteered" the Education Sector to be one of the pilots.

The leader of the Education Sector was new to the Bank. Prior to coming to the Bank, she had effected major change in other organizations. These experiences gave her a strong foundation in change management. Her empowering style of management coupled with the fact that she was not entrenched in the existing Bank culture played an important role in the speed of implementation. In her previous role, she understood the effect of networking outside of the organization. She encouraged her staff to spend a lot of time outside of the Bank with other organizations learning what they were doing in knowledge management. In the end, a very unified external and internal

team was created. An additional factor which pushed the changes throughout the organization was the act of giving the thematic groups a budget which basically was funding of the communities at the institutional level.

Overcoming Resistance to Organizational Change

There is a richness in the history of the development of thematic groups that can be utilized in any effort at organizational change. They had to deal with not only internal group conflict and priorities but also with multiple network interactions as discussed earlier.

In the article "If Only We Knew What We Know" (Carla O'Dell et al, 2000) seven organizational resistance to change points are identified. The Education Sector's success in addressing them lead to an effective knowledge management program implementation.

These resistance points pivot around:

a.   shifting the culture towards sharing,

b.   setting and implementing quality standards,

c.   maintaining the system to avoid knowledge "junk yards",

d.   ensuring that the system stays demand-driven,

e.   balancing new information versus better access to current information,

f.   resolving external issues such as confidentiality, and

g.   achieving an integrated approach across the organization.

Communities of Practice: Garnering Best Expertise

The demographics of the core group responsible for building content may have been a positive factor in implementation. The initial core group consisted of ten percent of the total community or approximately twenty-five people. They were divided into ten teams of two people or three people. The core members were typically younger than the average community member. They were also more comfortable with the use of web technology than most people in rest of Bank. They experience a sense of innovation and were having fun being involved with the project. As a result, they were passionate in their efforts and creative in their solutions. This contributed to the success in justifying funding from project money for many of the groups.

The analysis and empirical findings through our interviews of the people involved and discussed earlier in this case, indicated that a core group of people who are experienced knowledge sharers is essential to implementing a knowledge management approach. The key concerns of people focused on knowledge generation and diffusion are the scope and age of knowledge content, potential uses of knowledge, and the processes and associated costs of knowledge generation and diffusion as well as the context and impact of the knowledge in question (Carayannis, 2001).

Knowledge users are concerned with the following issues that determine their level of satisfaction:

- ease of use,

- ease of access,

- intuitiveness, and

- applicability of knowledge.

Knowledge users are also affected by the concept of push versus pull relative to how knowledge is shared. It is very effective to present information to a knowledge user in accordance with his or her needs. This is the push concept. However, it may be just as effective to allow the user to "pull" information based on the analysis that is taking place. The World Bank used a combination of "push" and "pull".

The pull concept was utilized by having the Advisory Services Group respond to inquiries from users in the regions. The push concept was intentionally utilized whenever responses to the inquiries were sent out. The Advisory Services responder would often include additional related information so as to inform the requestor of the availability of more knowledge and the richness of the content.

During the implementation process the organization was being sold on knowledge management, however, the core group would use different terms if it were more acceptable to individuals. They did not just stay on a path of communications if it was not working. It was an overt effort at decentralization. People were set free to be innovative.

Assuring Quality, Relevance and Currency of Content

In the education sector, Harry Patrinos understood early on that the Thematic Groups needed to focus on quality, not quantity. The content of the knowledge management tool had to be directly related to the needs of the users. He felt that for the educators, they required a focus on tools such as economic analysis tools, training and best practices. Although this resulted in discarding much of the proposed content, it led to a more effective approach.

In effect, online knowledge is an **experience good** (Shapiro & Varian, 1999) that needs to win the minds and hearts of the clients each and every time it is being accessed (or experienced). The **brand (or intrinsic good will)** of an experience good is impacted positively or negatively each time it is used, and hence, it is critical to manage **the quality, robustness, relevance and currency of the content and the enabling infra-structure** in online knowledge management and sharing environments (Carayannis, Summer 2001). It seems that this battle of the *"online brand"* has been won to date by the Educational Sector TG.

Technology: Effective Use of Tools

A knowledge management system should be easy to use and up to date as mentioned before. Hence, the features or the functions of the tools should help one to access and manage the content almost intuitively. **The system itself should be able to age content**. For example if a project content expires in three days, it notifies the owner to update it. Knowledge management systems should also prompt the users when content is a certain age and that it is time to update the content. Tools and features such as this will greatly enhance the usefulness of the knowledge management system and its ability to add value and remain relevant to the users.

In this context, every effort made was not necessarily successful as our study found. There were many things tried that did not work. An example is one of the systems that was a directory of expertise that had some mandatory fields with free form text and it proved not very user-friendly and hence was not well accepted. Human Resources called it a skills base, however, there were some skeptics among the users suspecting that this was an attempt to take advantage of users' natural propensity to interact with the web out of human curiosity, in order to be able to monitor their interactivity patterns and keep tabs on them.

A key aspect of effective knowledge management and sharing is that they improve electronic collaboration. Some specific requirements are:

- to encourage discussion,

- to not be limiting in the amount of input one can contribute, and

- to promote information sharing.

In this context, our field interviews revealed that the Education Sector did better than others at reconciling the central agenda with users' needs.

Ease of use includes and implies that individual and organizational learning takes place via the continuous use of the knowledge base. The higher the ease of use, the more intuitive is the nature of the knowledge sharing application and the higher the ability to prevent one from retracing the same steps. Moreover, to improve the entire process, the burden of input of knowledge by the creator of the knowledge must be minimized to encourage knowledge sharing. Conversely, the users of knowledge must have **tools that are flexible enough or 'intelligent' and functional enough** to allow various people to search through data in various ways to get various answers to different questions. This removes the burden on the creator of the knowledge of having to understand what is wanted when it is first input well as of having to anticipate future user needs and queries.

Focus on Measurements: Measuring Intangibles for Tangible Outcomes

Some of the key concerns of the World Bank knowledge creators such as **the timeliness or speed of creation of new knowledge, access to knowledge sharing methods and innovation**, were also the focus of measurements undertaken. The specific measurements were not in place to quantify these results, however, they were noted as observations.

It may be impossible to determine the contribution of knowledge management with complete accuracy. This is true with most intangibles. It is more germane to talk about the contributing role of knowledge management and specifically knowledge creation and knowledge sharing. The arguments are very similar to technology. What is the value of technology? There are all sorts of different ways for calculating the value of the technology going from concept to market, if it is early on in its development cycle. However, the exact value of technology is not solely the value of the commercial enterprise that results from the technology. Technology is one of the ways and means that sustainable value is added to customers and users along with other activities that focus on understanding **user requirements, user friendliness, and user acceptance**. In evaluating knowledge management and sharing, we need to take a more holistic approach towards including in our analysis **human and social as well as technological critical success and failure factors** as discussed earlier.

6.0. Conclusions and the Road Ahead: Key Open-ended Questions for Best Practices in Knowledge Management and Sharing

This case study identifies the elements of organizational change that were enacted within the World Bank to facilitate knowledge management and sharing, and in particular it focuses on the Education Sector Thematic Network knowledge management initiatives and outcomes. It also addresses the value added to the front line organizations responsible for the implementation of knowledge sharing. An open question to which this case leads is about **the need for an assessment of the effectiveness of the knowledge management program in improving the capabilities of the operational staffs** in particular World Bank regions through knowledge sharing institutional reforms and operational interventions. This is a question of adapting the thematic, specialized knowledge at the "ground level" in the regions. It is outside the scope of the information documented within this case and must be determined by follow up research.

Another question is, **"Would the availability of better metrics have helped the implementation of the knowledge management program?"** The response is yes, but of course the challenge is *to **identify functional and effective metrics that serve a purpose and do not become the end rather than the means***. However, it is important to point out that *the simple act of monitoring and measuring knowledge-related processes* could have helped improve the implementation of both the organizational change and the knowledge management program within the Education Sector. The organizational change was reflected by the change in culture relative to knowledge sharing. The effect of the knowledge management program implementation was reflected in a reduction in response cycle time, improved quality of operations and organizational innovation.

Measurements help regardless of the quality of the measurement definitions and whether or not they measure the value of the knowledge being shared. Measurements will drive improvements and are an important element of a knowledge management program. It takes many iterations to create an effective measurement system. The objective is to have one that is consistent and repeatable. The act of going through the iterations may produce process improvements or yield other results that are more beneficial than the measurements.

An additional major question is related to **how an organization goes from enactment of a knowledge management program to sustainability.** A model which possibly explains this concept is that of a knowledge market. The participants consists of buyers of knowledge and sellers of knowledge. Initially the Education Sector invested a lot of resources in encouraging knowledge transactions among the participants. Eventually, the program becomes sustainable through grass roots motivation. That motivation is in the form of a barter system. People are willing to share knowledge because they may be in the position to be a recipient of knowledge at a later point in time. In addition to access to knowledge, by participating, people gain access to contacts. This helps build a network of trusted individuals. Studies of workplaces, critical theory and organizational memory supports the connections between knowledge management and the social aspects issues. Helsley and Strange (2001) identify the major contributing aspects of the model which facilitates bartering as the formation of small communities, deliberate efforts to transfer knowledge, reciprocal benefits in transferring knowledge, choice in the knowledge being transferred and a reduction in transfer costs.

The current impact of the Education Sector knowledge management implementation can be characterized *by **collaboration, teaming, socialization, learning, and networking***. As a pilot implementation, these lessons were utilized in subsequent rollouts of the knowledge management system to other sectors. These factors were significant in The World Bank's accomplishment of

engendering, catalyzing and sustaining the ongoing process of transforming itself into a knowledge bank.

Overall, enduring questions that can be addressed only in the context of a continuous improvement process are:

1. How can we identify, attract and empower more effectively and efficiently organizational change champions and knowledge catalysts?

2. How can we better identify and corroborate the value proposition intrinsic in knowledge sharing initiatives?

3. How can we design such initiatives so they are more sustainable and with longer term and broader scope impact?

4. How can we better measure the value added by intangibles such as knowledge?

5. How can we better manage and share tacit knowledge?

6. What are ways and means to enable, catalyze, and accelerate sustainable knowledge sharing within and across organizations?

7. How can we best identify and replicate best knowledge sharing practices?

These questions could serve as an intellectual roadmap for the road ahead in further such studies of knowledge management, sharing and measurement within and outside the World Bank Group in which the author is currently engaged.

References

Arthur Andersen LLP. World Bank Knowledge Management Concept Paper: A Practical Approach. Circa 1996.

Carayannis, Elias, 1993. Incrementalisme Strategique, Le Progres Technique, Paris, France.

Carayannis, Elias, et al, 1994a. A Multi-National, Resource-Based View of Training and Development and the Strategic Management of Technological Learning: Keys for Social and Corporate Survival and Success, 39 International Council of Small Business Annual World Conference, Strasbourg, France, June 27-29.

Carayannis, Elias, et al, 1994b. The Strategic Management of Technological Learning from a Dynamically Adaptive, High-Tech Marketing Perspective: Sustainable Competitive Advantage through Effective Supplier-Customer Interfacing, University of Illinois at Chicago / American Management Association Research Symposium on Marketing and Entrepreneurship, Paris, France, June 29-30.

Carayannis, Elias, 1994c. Gestion Strategique de l'Acquisition de Savoir-Faire, Le Progres Technique, Paris, France.

Carayannis, Elias, 1994d. The Strategic Management of Technological Learning: Transnational Decision Making Frameworks and their Empirical Effectiveness, PhD Dissertation, School of Management, Rensselaer Polytechnic Institute, Troy, NY.

Carayannis Elias and Ray Stokes, A Historical Analysis of Management of Technology at Badische Anilin und Soda Fabrik (BASF) AG, 1865 to 1993: A Case Study, Journal of Engineering and Technology Management, vol. 14, pp. 175-193, 1997

Carayannis Elias, Re-engineering High Risk, High Complexity Industries through Multiple Level Technological Learning: A Case Study of the World Nuclear Power Industry, Journal of Engineering and Technology Management, vol. 12, pp. 301-318, 1996

Carayannis Elias, Everett Rogers, et al, High-Technology Spin-offs from Government R&D Laboratories and Research Universities, Technovation, vol. 18, n. 1, pp. 1-11, 1998
Carayannis Elias, Fostering Synergies between Information Technology and Managerial and Organizational Cognition: the Role of Knowledge Management, International Journal of Technovation, May 1998

Carayannis Elias, Higher Order Technological Learning as Determinant of Market Success in the Multimedia Arena; A Success Story, a Failure, and a Question Mark: Agfa/Bayer AG, Enable Software, and Sun Microsystems, International Journal of Technovation, v. 18, n. 10, pp. 639-653, 1998.

Carayannis Elias, The Strategic Management of Technological Learning in Project / Program Management: The Role of Extranets, Intranets and Intelligent Agents in Knowledge Generation, Diffusion, and Leveraging, International Journal of Technovation, v. 18, n. 11, pp. 697-703, 1998

Carayannis Elias and Jeffrey Alexander, The Wealth of Knowledge: Converting Intellectual Property To Intellectual Capital In Co-opetitive Research and Technology Management Settings, International Journal of Technology Management, v. 17, n. 3/4, 1998

Carayannis Elias, The Strategic Management of Technological Learning in Project / Program Management: The Role of Extranets, Intranets and Intelligent Agents in Knowledge Generation, Diffusion, and Leveraging, *Technovation*, vol. 19, 1998

Carayannis, Elias, Fostering Synergies between Information Technology and Managerial and Organizational Cognition: the Role of Knowledge Management, International Journal of Technovation, December 1998.

Carayannis, Elias, Distance Education and Intellectual Property Rights: A Public vs. Private Sector Perspective & Analysis, Invited Lecture, Rensselaer Polytechnic Institute, Troy, NY, June 25, 1999.

Carayannis, Elias and Rudy Watson*, Knowledge Management and Measurement: Managing Intangibles for Tangible Outcomes, Portland International Conference on Management of Engineering and Technology (PICMET 2001), Portland, Oregon, 29 July to 1 August, 2001.

Carayannis, Elias, Global Development Gateway & ECA Country Gateways Strategic Analysis, World Bank Group Internal Document, Summer 2001.

Chomsky, N. et al, *Chomsky: Selected Readings*, Oxford University Press, NY, 1971

Chomsky, N., *Language and Thought*, Moyer Bell, RI., 1993

Dodgson, M., 1993. Organizational Learning: A Review of Some Literatures, *Organization Studies*, vol. 14, no. 3, 375-394.

Denning, Stephen, Presentation to Doctoral Seminar on Science, Technology & Innovation offered by Professor Elias G. Carayannis, Department of Management Science, School of Business & Public Management, The George Washington University, 2 March 1998, Washington, D.C.

Denning, Stephen, "What is Knowledge Management?", The World Bank Group, 1998.

Denning, Stephen, "The Springboard: How Storytelling Ignites Action in Knowledge-Era Organizations", Butterworth Heinemann, Boston, 2000.

Garud, R. and Rappa, M., 1994. A Socio-Cognitive Model of Technology Evolution: The Case of Cochlear Implants, *Organization Science*, vol. 5, no. 3, August

Halpern, D., 1989. *Thought and Knowledge: An Introduction to Critical Thinking*, Lawrence Erlbaum.

Helsley, Robert W., Strange William C., "Knowledge Barter", working paper, University of British Columbia, July 2000, Revised January 2001.

Laporte, Bruno. Interview by the first author with Bruno Laporte, Coordinator, Knowledge Sharing Program, 2 March 2001 and 14 March 2001

O'Dell, Carla, Grayson Jr., C. Jackson., "If only we Knew What We Know", The Free Press, New York, 2000

O'Rourke, Maris. Interview by the first author with Maris O'Rourke, former Director of the Education Sector, 29 June 2001

Pattillo-Siv, Martha. Interview by the first author with Martha Pattillo-Siv, Coordinator, Education Advisory Services, 14 March 2001 and 2 April 2001

Patrinos, Harry. Interview by the first author with Harry Patrinos, Senior Education Economist, Human Development Network, 12 April 2001

Polanyi, M., 1958. *Personal Knowledge*, The University of Chicago Press

Polanyi, M., 1966. *The Tacit Dimension*, Routledge

Schon, D., 1983. *The Reflective Practitioner: How Professionals Think in Action*, Basic Books

Shannon, C.E. & Weaver, W., 1949. *The Mathematical Theory of Communication*, Univ. Of Illinois Press

Shapiro Carl & & Hal Varian, Information Rules, Harvard Business School Press, 1999

Simon, H., 1969. *The Sciences of the Artificial*, MIT Press, Cambridge, Mass.

Siva, Ramesh. Interview by the first author with Ramesh Siva, Information Technology Services, 2 April 2001

Stevens, Greg A. and James Burley, "3000 Raw Ideas = 1 Commercial Success," Research Technology Management (May – June 1997): 16 –27

Sveiby, K., What is Knowledge Management?, http://www.sveiby.com.au

Teece, D. J., G. Pisano, and A. Shuen. "Dynamic Capabilities and Strategic Management." *Strategic Management Journal*, 18(7), 1997, pp. 509-533.

Young, Mary Eming, Interview by the first author with Mary Eming Young, MD , Senior Public Health Specialist, Human Development Network, 19 April 2001

Wiig, K. Knowledge Management Foundation. Schema Press. 1993

Mission of World Bank Institute

This mission of WBI is to help World Bank clients and staff acquire new development knowledge and skills through a variety of courses, seminars, and other learning events. It designs programs on topics related to economic and social development for governments, nongovernmental organizations, and other stakeholders. The Institute produces and disseminates publications and electronic information products that support these objectives.

For information on WBI publications write to:

Publications
WBI
The World Bank
1818 H Street, NW
Washington, DC 20433
Tel: 202-473-6349
Fax: 202-522-1492

Visit us on the World Wide Web at:
http://www.worldbank.org/wbi

SN37206