Knowledge Management in Higher Education Institutions

May 7, 2010

Jay Liebowitz, D.Sc.
Orkand Endowed Chair in Management and Technology
Graduate School of Management & Technology
University of Maryland University College
jliebowitz@umuc.edu
There is tremendous interest in »making connections«, as shown here on Slide 2, where The Economist back in January had a special issue on »A world of connections«. They report on social networking on the internet and many of the articles in the issue discuss its use within business, showing that it is here to stay and there are undoubtedly great potential benefits.
The European Council stated in Lisbon 2000 that Europe should become by 2010 ‘the most competitive and dynamic knowledge-based economy in the world.’ The continuous change in European educational expectations due to the Bologna Process and the demands for an EU area of educational collaboration have been gradually replacing the old-fashioned routine management with ICT-based knowledge management, leading to the emergence of an Academic Intelligence Management.”

The promise of knowledge management and social networking in higher education institutions can be shown by this quote. Higher education institutions are the nucleus of research and future development acting in a competitive environment, with the prerequisite mission to generate, accumulate, and share knowledge. What we are seeing is the emergence of information and communications technology-based knowledge management and collaborative practices through social networking means.
In fact, the outgrowth of these developments has resulted in what national, state, and local governments are calling “knowledge cities”. In fact, the next Knowledge Cities Summit is scheduled for this November in Melbourne.
When we talk about knowledge cities, the university plays a major role. That role can be the urban innovation center, where the university works collaboratively with the government and industry to help foster research and development that gradually get transformed into creation of products and services. Some of the knowledge cities include Melbourne, Barcelona, Stockholm, Munich, Montreal, and others.
The knowledge city concept has knowledge management at the core, with interactions with citizens within and beyond the city limits. Through building and nurturing a knowledge sharing culture, coupled with the ICT capabilities and the infrastructure of the city from a system viewpoint, this should lead to knowledge-based development.
In a recent report by the Work Foundation in the UL, they talk about embedding universities within a knowledge city construct in what they call the “ideopolis” framework.
As shown in slide 8, the university again plays a critical role. The Government can help by reviewing the flexibility of the funding and incentives it provides for joint work provided to both universities and to local authorities and sub-regional partnerships. In addition, education institutions are extremely important in cities as they grow their knowledge-based industries. We can see this with 2 cities in the US, for example. Detroit, the main automobile manufacturing hub in the US, was hurt over the many years by the impact of foreign cars. Similarly, Pittsburgh, the main steel manufacturing city in the US, was also hurt by relying solely on this industry for the city's base. The difference, however, between the two cities is that Pittsburgh linked with local universities such as Carnegie-Mellon University, University of Pittsburgh, and others to develop its intellectual capital for knowledge-based development so that the city didn't become dependent upon only the steel industry. Detroit, on the other hand, even though they have many good schools nearby like the University of Michigan, Wayne State University, Michigan State University, etc., never really took full advantage of their intellectual capital, and as a result, Detroit has had among the highest unemployment rate for any city in the U.S.
Although much of the history of intellectual capital literature spans only a decade, the national view of this phenomenon is in its infancy. There have been only a few countries that have examined their intellectual capital development: Sweden, Israel, and one of the Arab nations. Some of the key principles for a nation’s intellectual capital development are:

- human investment through education and training;
- viewing workers as intellectual assets; and
- implanting and nurturing innovative, developmental and cost saving behaviors in firms and government

In an organizational context, we think of intellectual capital as human capital, structural capital, social/relationship capital, and competitor capital.
Today’s universities are very much like companies—functional siloed and stove-piped. This is where knowledge management and related technologies can help by being the integrative mechanism to build the bridges across the isolated islands of knowledge.

There was an interesting report last year called "Jamming for a smarter planet" by IBM.
There were about 2,000 individuals from 40 countries that provided input interactively over a 72 hour period. You can see the breakdown of those contributors, being from students/faculty/administrators at universities, industry, and government.
Key Insights from Jam 2009

• Success in the services-based global economy requires academia, government and industry to work together to create “T-shaped” people. T-shaped people are those who have deep knowledge in one discipline and broader knowledge in others.
• Education is not keeping up with the pace of technology change (e-learning; integrated approach).
• Collaboration between industry and education generates high value.

They found the following insights: "Success in the services-based global economy requires academia, government and industry to work together to create "T-shaped" people. T-shaped people are those who have deep knowledge in one discipline and broader knowledge in others.

• Education is not keeping up with the pace of technology change (e-learning; integrated approach like ISAT).
• Collaboration between industry and education generates high value.
Over the recent years, there has been some interesting research in applying knowledge management to higher education institutions. One paper from last year talks about the importance of the paradigm of KM in higher educational institutions in Lithuania. They talk about how KM should become a part of higher education philosophy, even at the high school levels.

In the State of Ohio, in the Midwest part of the US, they are entertaining proposal to introduce KM concepts, proposals, and principals with the high school junior and senior based curricula.
In another part of the world in Malaysia, a paper was published last year about the need for knowledge sharing in higher education institutions. They found that the factors of the nature of knowledge, organizational culture, organizational commitment, and recognition were the critical success factors for knowledge sharing about faculty in a public university setting.
Knowledge Management as a Mechanism for Technological and Organizational Change Management in Israeli Universities (S. Shoham and M. Perry, 2009, Higher Ed Journal)

- KM-M-CM Model (Knowledge Management as a Mechanism for Change Management)
- Use KM strategies for the purpose of change management

In Israel last year, a similar paper was published talking about using KM as a mechanism for technological and organizational change management. They talk about using knowledge management as a change management mechanism for transforming the university from a "knowledge institution" to a "learning institution."
In 2007, there was a paper published in the European Journal of Education that compared Australia and Slovenia in terms of knowledge management in higher education from a cultural point of view. They found that the collectivist nature of the Slovenian culture emphasized teamwork, and the reasons given by the Slovenian responses for teamwork were:

• 20%: Increased opportunities for discussion
• 45%: Improved knowledge/information
• 25%: Improved motivation
• 10%: Greater efficiency
• Collectivist nature of the Slovenian culture
In another research study published in 2008, it looked at faculty attitudes for knowledge sharing in South Korea. They found that: Perception and recognition/reward systems are the most influential factors for faculty knowledge sharing.
IBM, the Global Education Division, wrote a study last year on Education for a Smarter Planet: The Future of Learning.
They recommend the following policies that governments and education institutions should consider to enable education system transformation and proactively build smarter education systems:

- **Adopt and promote a vision of personalized learning** (services and tools should support learning flexibility, customization, and migration).
- **Establish student-centric versus institutionally-centric processes** (building smarter educational systems will require a new focus on managing and improving the entire process of lifelong learning).
- **Promote open standards and open platforms in technology** (Open, standardized technology will enable the broad market of commercial providers, foundations, and educational developers to all contribute toward innovation—interoperability is the key word).
- **Consolidate services across institutions and agencies** (Cloud computing and students throughout a state or region can expect common services to be delivered through the "Education Cloud" of their system.)
- **Support the transformation of educational systems with all stakeholders** (Improved outcomes from education systems will only be achieved with full community engagement).
From Jim Spohrer’s (the IBM University Programs Director in the US) work he claims that there has never been a better time to make our education technology systems, both in the US and worldwide, smarter. By the way, in 2009, Slovenia fared very well in terms of top performers in science as you can see from the Slide.
When we look specifically at the future services and networks areas, we observe some interesting parallels, as cited by John Brisbin and Chris Day, as shown in Slide 22. The first is that networks are where the knowledge lives and grows. There is something organic about networks and the informal organizational networks can be very powerful. The second point is that management is about optimizing the network rules in order to generate the most knowledge out of the networks. There is a popular business rules community where similarities exist. And third, innovation DEMANDS networks. That is, it's the connections one makes outside of one's own discipline or department where much innovation is often derived.
With all these possible trends in future networks and services as a backdrop, let me state the importance of what I am calling "strategic intelligence" which should help drive innovation, as shown in Slide 23. Strategic intelligence, in this sense, is the collection, application, and management of intelligentsia in order to improve an organization's strategic decision making. A process view of strategic intelligence, as defined by Donald Marchand, is that strategic intelligence should be deep-rooted within a company's fundamental organization culture, rather than being grafted on as another function. I look at strategic intelligence as having 3 possible components—KM—knowledge management, BI—business intelligence, and CI—competitive intelligence.
If we turn to slide 24, KM is the knowledge-enabled part of the Venn diagram where areas like knowledge retention and transfer, and social networking play a role. Business intelligence may be the learner-centered component where areas like e-learning, data/text mining, and social networking again play importance. And competitive intelligence is the community-enabled/external-competitor component where again, social networking may be relevant. I want to delve into the knowledge retention & transfer issues under knowledge management and then the social networking aspects under CI, but let me say a word about the learner-centered aspects via e-learning under BI, as shown in Slide 25.
I am at the University of Maryland University College where we have about 94,000 students in 28 countries. Almost all of our courses are through e-learning or blended learning, and the growth of online learning, especially for corporate workforce development, is growing tremendously. From all the estimates as shown on this slide, e-learning is experiencing major growth in both traditional and corporate universities. The acquisition, sharing, and application of knowledge through e-learning will continue to be paramount in the years ahead.
“Leaders Know How to Make the Most of Knowledge Management” (September 9, 2009, Credit Union Times)

• Society of Human Resource Management study (April 2009):
  – Organizations that optimize knowledge management are leaders in their fields.
  – “While some firms may view knowledge management as nice to have, proactive organizations see it as a key component of an effective business plan.”

With that said, let me focus on knowledge retention and transfer issues under knowledge management, and then talk a bit about social networking. In Slide 26, an interesting Society of Human Resource Management study on knowledge management last April showed that organizations that optimize KM are leaders in their fields and the pro-active organizations view KM as a key component of an effective business plan. Most of the research shows that KM can lead to innovation—you leverage knowledge internally and externally to generate new knowledge in the form of products and services.
Importance of Cross-Generational Knowledge Flows

• “Generational differences significantly impact employee attitudes and outcomes in the workplace. If firms are unable to modify their cultures and work environments to adequately meet the needs of their younger generation employees, they will continue to experience high levels of dissatisfaction and turnover.”


A hot topic within the KM community and community at large deals with knowledge retention as related to cross-generational knowledge flows. As evidenced by this quote in Slide 27, organizations must be sensitized to these cross-generational issues which impact employee attitudes and outcomes. Let me say just a few words from my research and others.
As shown in Slide 28, even though knowledge retention is an important issue, very few organizations have a formal knowledge retention (KR) strategy as part of their KM or human capital strategy. This slide is from a survey conducted by one of my students looking at mostly government agencies, and about 80% of the respondents didn't have a formal KR strategy.
Similarly, as shown in Slide 29, this is a study conducted in January 2009 by the Institute for Corporate Productivity in Tampa, Florida, and they surveyed mostly companies and found that out of the 426 organizations that responded, over 77% didn’t have an owner for knowledge retention initiatives and about 68% had not specific dedicated budget for knowledge retention initiatives. Knowledge retention challenges exist in the federal, state, and local governments, not-for-profits, and many industry sectors including energy, utilities, aerospace, manufacturing, even education and others.
As shown in Slide 30, I wrote a book last year looking at knowledge retention strategies and solutions, and I feel that organizations should embrace at least 4 key pillars underpinning a knowledge retention strategy. Having a recognition and reward system that supports knowledge retention and transfer activities is important. You want to strive for intrinsic motivators (versus extrinsic), where the intrinsic ones (recognition, etc.) are more lasting and permanent. It's important to have a bi-directional knowledge flow whereby senior leadership pushes these principles throughout the organization as well as a grass-roots, bottom up effect where staff excite their managers who then excite their senior leaders. The third pillar deals with personalization and codification strategies as knowledge retention and transfer approaches. Personalization refers to the people-to-people connection approach and codification deals with the system-oriented, collection approach. The fourth pillar is the "golden gem", that is, looking for creative ways to use retirees to fill various knowledge and skill gaps.
I have done some work sponsored by the Navy and DoD Command and Control Research Program, as shown in Slide 31, which focused on cross-generational knowledge flows in edge organizations. An edge organization is very network-centric, uses situational leadership, is robust, and works independently but has some overarching unifying strategy in mind. You can read David Alberts and Richard Hayes books on Power to the Edge.
Summary of the Findings

• Important as critical success factors for cross-generational knowledge flows:

  » **Shared understanding** refers to having a mutual conveyance and agreement of ideas that are shared between two parties.
  » **Reciprocity** refers to being willing to share one’s knowledge because given a similar situation, the knowledge recipient would share.

To highlight our findings. We identified 5 critical success factors for cross-generational knowledge flows, as shown in Slides 32 and 33. Having a shared understanding between the two parties, reciprocity whereby I'll share my knowledge with Joe because given the same situation I know he'll share his knowledge with me, the intrinsic worth of knowledge—how important is the knowledge being conveyed and having a subset of overlapping values to reduce generational gaps, the fourth being convenient knowledge transfer mechanisms (the personalization and codification approaches), and most important, interpersonal trust and respect. Actually, these critical success factors are pretty similar to knowledge transfer whether dealing with cross-generational knowledge flows or not.
» **Intrinsic worth of knowledge** refers to the value and merit of the knowledge being conveyed. A subset of overlapping values to reduce generational gaps is also important to lead to a common, shared understanding.

» **Convenient knowledge transfer mechanisms** need to exist for cross-generational knowledge flows so that “user adoption” will be enhanced. These knowledge transfer mechanisms could be either codified or personalized approaches to sharing knowledge.

» **Interpersonal trust and respect** for each other will enhance knowledge sharing as well.

• Knowledge sharing was more likely to occur with individuals with pro-social traits—that is, people concerned more about the group collective goals versus individual agendas.
“Learning Gets Social”  
(T. Bingham, T&D, August 2009)

- ASTD and i4cp conducted research on informal learning:
  - 98% of those surveyed say that informal learning enhances employee performance
  - However, 36% dedicated no money to informal learning and 78% dedicated 10 percent or less of the training budget to it
  - Web 2.0 Study (ASTD/i4cp/Booz Allen): only a small minority of companies are using Web 2.0 technologies in learning

Now that we have talked about the knowledge-enabled and learner-centered sides of strategic intelligence, let me discuss the community-access component through social networking—the essence of innovation. As shown on Slide 34, From the Association for Training and Development and i4cp study, informal learning enhances employee performance but not enough resources are being allocated to enhance and leverage this informal learning. In fact, according to Katzenbach Partners, a consulting firm in NY, most organizations don't fully understand or leverage the grapevine effect, partly induced by social networking.
The good news is that, as shown in Slide 35, adults are getting "more social", if you will. According to the Communications of ACM, those 55 and older internet users who have a profile on an online social network quadrupled during the past 4 years. According to a 2009 article by Gonzalez, almost 40% of the US Facebook users are above the age of 34 and are NOT NetGeners. There is even a new movie being completed now called "The Social Network" (starring Justin Timberlake) which is based on the Facebook company experience. I heard Chris Hughes, one of the co-founders of Facebook, give a talk about 3 months ago and he said there were 350 million users of Facebook, and 70% are outside the US.
Just to show you the popularity of social media, Slide 36 indicates some statistics for just one month of blogging in June using the Wordpress blogging platform. The numbers are astounding. In the Feb. 2010 KMWorld, there was a nice article on the use of sentiment analysis and text analytics to gauge customer satisfaction on these social networking sites.
One reason why social networking is growing is the business proposition. As shown on Slide 37, Forrester (one of the leading research firms) predicts that social networking will account for nearly half of the $4.6 billion market it forecasts for Web 2.0 products by 2013.
Social Network Analysis

- Social network analysis [SNA] is the mapping and measuring of relationships and flows between people, groups, organizations, computers or other information or knowledge processing entities.

One of the techniques that I have been using, and has been gaining ground in the knowledge management community, is called social or organizational network analysis, as mentioned in Slide 38. You will relate to it, as it is based on graph theory and link analysis. Essentially, you are looking for the minimum geodesic distance, the shortest path, between two nodes. It is a wonderful technique to use for mapping knowledge flows and knowledge gaps in organizations.
This technique has been used in many applications, including looking at the collaboration of senior executives after a multinational merger/acquisition took place. On Slide 39, a nice application of SNA was presented at the January 2010 HICSS conference to determine different user roles for establishing an online innovation community.
Let me show you some examples of social network maps from some of my work. In slide 40, this is showing you the flow of strategic knowledge through over 28 departments in an international financial service organization. Most of the departments are nested together, but there are a few outliers, like Dept. 24 in the top right corner, or Dept. 20 in the left corner, or dept 15 at the bottom. This may be okay, but what if I said that Dept. 24 is the strategic planning department for the company—then they may not be in the best position to pass strategic knowledge through the organization. Maybe they really should be at the hub or centrix of the clustered departments. You can identify "structural holes" through SNA—that is, those departments in this case were certain knowledge may not be flowing through them.
Let’s take another social network map for the same organization, as shown in Slide 41. This is showing the flow of process knowledge from the senior (executives, directors, and managers in the green cube) to junior level employees (non-management staff in the purple cube). The numbers refer to employees to keep names anonymous. There is very little transference of process knowledge from the senior employees to the junior ones. Of course, you aren’t seeing the statistics (means, standard deviations, etc.) being calculated behind the scenes, but these visualizations may give added perspectives on the flow of knowledge in the organization.
Another view of slide 41 can be shown in slides 42 through 45. This is a web-centric view of the flow of process knowledge between senior and junior level employees. As you drill down, looking towards the middle of slide 43, then slide 44, and then slide 45, you will see employees 157 and 158 (senior level) who have a number of connections to junior employees.
In slide 46, this is a web-centric view, using departments and positions in the company, of context knowledge flow.
As shown in Slide 47, you can even identify brokering rules of individuals—that is, who are the isolates (peripheral specialists—not well-connected), carriers (boundary spanners between 2 groups), transmitters—people willing to send/transmit their knowledge, and receivers—those willing to receive the knowledge. In this organization, there is little collaboration as out of the 698 employees, for any of the six types of knowledge show on the left side (context knowledge, expert process knowledge, general knowledge, process knowledge, relationship knowledge (who knows who types of knowledge), and strategic knowledge). The dominant type is an isolate by far, very few carriers/boundary spanners, people are willing to receive the knowledge, but fewer people are willing to send their knowledge. Not a very healthy organization for a collaboration, knowledge flow-perspective.
Let me try to wrap up with these last 3 slides. In slide 48, Kim et al. published a paper in 2010 on trends of social web sites. They indicate that there will be increased support for mobile devices and internet phones, location-based and data mining based services, support for a broadcast feed to multiple social web sites, and social features will be added to non-social web sites. Based on the attendees in this workshop and from Kim's work, some of the top social web sites with over 30 million registered users include, in order: Facebook, myspace, Windows live spaces, Habbo, Friendster, Hi5, Tagged, Orkut (popular in Brazil/India), etc.
Concluding Comments

- Techniques like SNA can provide added insights into the grapevine effect and can facilitate innovation and informal learning
- Cross-generational knowledge flows and knowledge retention & transfer will become increasingly important to organizations
- E-Learning will continue to play an important role for stimulating learning and creativity
- Governments need to think about creating “knowledge cities” with universities as urban innovation centers

These areas will add to macro and micro strategic intelligence.

So here are some concluding comments in Slide 49: Social network analysis can provide added insights into identifying and leveraging informal organizational networks; cross-generational knowledge flows and knowledge retention & transfer in general will become increasingly important as the workforce gets grayer; e-learning will continue to play an important role for stimulating learning; Governments need to think about creating "knowledge cities" with universities as urban innovation centers. All these areas will add to the macro and micro strategic intelligence.
Let me close with a final thought as expressed in Scott Anthony’s book— The Silver Lining, as shown on Slide 50: the biggest silver lining for innovation is the scarcity that is sure to result from the current economic climate which is actually a good thing for innovation. The leading organizations will find a way to position themselves towards investing in themselves—their human capital—so that once out of this economic downturn, they will be ahead of their competition.