



How to Tie Everyday Work to Strategy

The Harvard community has made this article openly available. [Please share](#) how this access benefits you. Your story matters

Citation	Kennedy, Mary Lee, and Malgorzata (Gosia) Stergios. 2009. How to tie everyday work to strategy. <i>Journal of Information and Knowledge Management</i> 8(4): 287-300.
Published Version	doi:10.1142/S0219649209002403
Citable link	http://nrs.harvard.edu/urn-3:HUL.InstRepos:3875046
Terms of Use	This article was downloaded from Harvard University's DASH repository, and is made available under the terms and conditions applicable to Open Access Policy Articles, as set forth at http://nrs.harvard.edu/urn-3:HUL.InstRepos:dash.current.terms-of-use#OAP

How to Tie Everyday Work to Strategy

Mary Lee Kennedy

Harvard Business School Knowledge and Library Services
mlkennedy@hbs.edu

Malgorzata (Gosia) Stergios

Harvard Business School Knowledge and Library Services
gstergios@hbs.edu

Abstract: The paper describes how Harvard Business School's Knowledge and Library Services (KLS) leveraged collective knowledge of its employees in formulating, implementing, and evaluating strategy. The organization was faced with major, disruptive changes in its environment and needed the diverse knowledge and a full engagement of all employees to make a series of strategic shifts. The shifts included integrating KLS products and services with the Harvard Business School research and course development process, developing global scope in information resources and expertise, and trading its role as the guardian of books and buildings for the organizer of the School's priority information assets. In order to achieve that, KLS launched the Environmental Scan Program relying on employees' insights aggregated through social tagging, trend analysis and internal prediction markets tracking emerging trends. KLS also created processes for collective assessment of strategy and a faster way of turning ideas into new products and services. The paper concludes with the assessment of the approach, pointing to a difficult balance between emergent and collective dimensions of strategy process with its formal, structured facets.

Keywords: Collective intelligence; strategy management; opportunity management; prediction markets; information professionals.

1. Introduction

The following paper describes how an organization, Harvard Business School's Knowledge and Library Services (KLS), employed "collective intelligence," that is, the aggregate knowledge formed from diverse individual judgments, insights, opinions, and experiences in formulating, implementing, and evaluating strategy. Like many organizations today, the organization faced major and disruptive changes in its environment, changes that

could only be mastered with the engagement of all its employees.

The approach builds on the work on Future Mapping, the theoretical foundation of Sense Making as first proposed by Karl Weick, the application of it to knowledge management as published by Chun Wei Choo and David Snowden, a review of strategy practice identified in the literature, and project work previously conducted by the authors in federal governments, high technology companies, think tanks, international organizations, and public service organizations.

The paper is structured around three main sections. A brief literature review in Section II sets a high-level context of how organizations address the issue of making strategy relevant to daily work of their employees. Section III, the central part of the paper, describes in detail how KLS developed and improved its strategy approach by integrating the traditional strategy formulation, implementation and assessment with processes designed to manage collective intelligence of the organization and new opportunities. The paper concludes with an assessment of the approach's successes and proposed improvements.

2. Brief Literature Review

Traditionally, the senior management team sets the strategy that the rest of the organization is asked to implement. Such a situation leads to a "strategy paradox" – a general, long-term strategy has to be translated into the daily, practical tasks of employees (Raynor 2007). Most hierarchically structured organizations rely on a formal process of strategy communication to ensure information flows between senior management and the

staff, along with lateral teams and units (Johnson and Coffey, 2007). It is important to use many forms of communications channels, both in-person (e.g., town hall meetings and employee discussions with managers) and those mediated by technology (e.g., through intranet, departmental websites, and bulletin boards) (Beer and Eisenstat, 2004). Such communication programs should be integrated with programs to connect the strategic objectives with individual performance goals (Kaplan and Norton, 2008).

Companies like Google or Nokia involve the entire organization in strategy creation in order to remain “strategically agile” (Doz and Kosonen, 2008). Agile companies excel at detecting early trends in their market environment and at maintaining a high level of employee creativity and innovation. Nokia, following IBM’s example, has been using “value jams,” an online brainstorming practice involving all employees (Bjelland and Wood, 2008). Google has opened its strategy process to all its employees, encouraging them to try and test any idea as long as it can be turned into a product that customers will buy (Hamel 2007).

Google’s strategy process is open to all employees who are encouraged to try and test any idea as long as it can be turned into a product that customers will buy. Google uses weekly all-staff meetings, idea boards, and intranet forums to test ideas. If there is a strategy process, it is part of what has been described as the “brink-of-chaos” management model (Hamel 2007).

Increasingly, companies are realizing that participatory culture and programs designed to aggregate the diverse knowledge, expertise and judgments of employees can increase innovation (Hamel 2007). New Web 2.0 tools are used to turn the valuable tacit knowledge of employees into applied knowledge of a service or product (Ambrosini and Bowman, 2001; Okhuysen and Eisenhardt, 2002). Such tools, including online collaboration platforms, discussion boards, podcasts, blogs, social networking, games, or recommendation networks, require strong role models from top management and an understanding of “cognitive diversity” (Bonabeau 2009; Li and Bernoff, 2008; Chui *et al.*, 2009; Page 2008).

Cognitive diversity involves different perspectives, interpretations, heuristics and predictive models (Page

2008). Diversity of perspectives leads to better solutions while diversity of predictive models allows large groups of people to make accurate predictions (Page 2008). Prediction markets, if designed well, can aggregate the dispersed knowledge of employees, especially in large, multinational organizations. As a result, many companies (e.g., HP, GE, Intel, Microsoft, Nokia, and Google) have been using prediction markets to screen new product ideas, forecast sales or take the pulse of employees or customers (Ho and Chun, 2007; Hahn and Tetlock, 2006).

Prediction markets (also called “idea futures,” “information markets” or “virtual stock markets”) are markets where independent traders sell or buy shares in the outcomes of future events. The market price of an event reflects the aggregated probability of an event. Prediction markets are forecasting tools that—when designed well to ensure high trading activity and independence of traders—can predict future events more accurately than polls, surveys, or expert panels (Wolfers and Zitzewitz, 2004). Those traders that predict more accurately are rewarded financially, often with virtual or “play” money. It is the potential for financial benefits that acts as an incentive to disclose information – although indirectly—through trading.

Google’s prediction market, one of the largest corporate markets, provides insight into how the company is processing information (Cogwill *et al.*, 2008; Wolfers and Zitzewitz, 2006).

The KLS process approach introduces iterative mechanisms that reinforce the relevance of the day-to-day work with the strategy.

3. How we did it

3.1. *The Organizational Context*

Knowledge and Library Services (KLS) is a small organization supporting research and teaching at Harvard Business School (HBS) through the exchange of ideas, expertise and information. It has been in existence in one form or another since 1926, though known as Baker Library until recently when we added knowledge management, information management, and knowledge dissemination to our core competencies. The organization's fifty-five members support HBS faculty, students, alumni, and staff, as well as researchers from Harvard University and beyond.

In recent years, like the rest of the educational world, KLS has had to drastically change in order deal with and derive benefit from the opportunities presented by the Internet, globalization, the economy, and the changing ways in which faculty, students and alumni work. Growing out of the traditional library experience, building- and book-centric both in the perception of its customers and in the staffing model, the organization took on a series of strategic shifts to align itself better with the environment in which it exists.

In 2004, KLS set out to establish a strategy that everyone in the organization owned. KLS initially based its' strategy process on two proven practices. They are:

1. **Future Mapping.** As a strategic planning mechanism, Future Mapping was first developed by David Mason and later used extensively by a strategy consulting company called NerveWire. The authors have used the technique in other organizational types (e.g. think tanks, high technology, and government). The Senior Management Team (SMT) believed that it was flexible enough to adapt to academia.
2. **Balanced Scorecard and Strategy Maps.** KLS employed the Strategy Map and Balanced Scorecard as mechanisms for communicating group-wide strategic objectives, and establishing annual targets for the entire organization.

While the creation of the strategy was collective, it soon became clear that the ongoing meaningfulness of the strategy was lost in day-to-day work. Reflecting on what the authors have learned about collective intelligence

(what it is, what benefits it can bring to organizations, and what are the processes and structures within which collective intelligence will play well), the SMT sought to use it in the context of strategy management as well. KLS went back to the original sources on sense making and collective intelligence by Karl Weick, Chun Wei Choo and David Snowden to develop an approach that would work well for the KLS organization.

3.2. *Strategy Context*

Through two strategic planning processes (in 2004 and 2007), KLS identified six strategic shifts required to align itself with the changed environment and the work of the School. The shifts represent the findings of the environmental scanning and analysis that took place as part of the Future Mapping process, and their confirmation as priorities with the Governance bodies to which KLS reports.

The shifts represented changes in what we do and how we do it. The six strategic shifts are:

- A shift from on-demand products and services to their programmatic integration with research and course development processes
- A shift from organizing library-like materials to organizing the School's priority information assets
- A shift from experimental Web design services to the development of enterprise-wide Web offerings that support the delivery of a world-class Web and intranet user experience
- A shift from listing electronic resources to embedding them in the context in which the user works
- A shift from an America-centric service model to one that supports global research and education through global expertise and information resources
- A shift from a support role in knowledge dissemination to becoming one of the primary vehicles for disseminating faculty research to practitioners.

In 2007, KLS reflected on the strategic accomplishments and on how well the organization had internalized and applied the shifts to daily work. Two formal feedback mechanisms indicated that the staff lacked an understanding of how their day-to-day work contributes to the shifts. Informal feedback received through day-to-day conversations indicated the same lack of

comprehension. The two formal indicators were a) the results of the bi-annual employee satisfaction survey, and b) the quarterly review discussions on progress against annual roadmaps. In the first case, staff are asked whether they understand how their work impacts the work of the department and the School, and they are asked several questions about the effectiveness of management in communicating with the organization. The analysts stated that employee engagement, defined as a commitment to the organization, would be much higher if the leadership team focused on improvements in both areas. A second source of information was informal conversations with staff. Over time, staff remained convinced they were doing the right work, but they were unable to see how their work related to the prioritized strategic shifts. An example of the disconnect between day-to-day work and strategy was the feedback received from informal discussions and focus groups on communication stating that the roadmaps did not account for what was termed “ongoing work”.

The need for consistent communication turned out to be the underlying lever the leadership team had to connect the dots between daily work and the strategic shifts. The communication theme emerged quickly when the senior and middle management reviewed the survey results and discussed the various informal conversations with staff. While a few senior members of the staff understood how the shifts were connected to daily work, the entire, perhaps the majority of the senior and middle management team could not consistently communicate it. The SMT agreed to start by focusing on three areas:

1. **Leveraging Collective Intelligence.** Both the process and the outcome would benefit if KLS leveraged the collective intelligence of the whole organization. The thinking was that if anyone could contribute their knowledge to a commonly understood set of themes and influence changes in the work through debate, review, and adoption of new knowledge, KLS would have started to make the strategic objectives tangible. This would be best achieved through embedding an ongoing monitoring practice in each individual’s goals to highlight changes in the environment. At first, the monitoring framework would be defined based on the themes identified in the Future State and then it would be updated based on emergent themes and the prediction of events by staff. Furthermore, the monitoring work would fill in

the gaps in communication between quarterly reviews and annual planning.

2. **Challenging the Strategy.** Individuals and groups needed to understand their daily work in the context of the strategy, and be empowered to identify needed changes to their daily work in order to achieve the strategic shifts. KLS needed an explicit set of tools to which everyone could refer to see how their work on any product, service, or project, tied back to the annual roadmaps and to the strategic shifts. A process was required so that individuals or groups would know when and how to register a change request to a product or service, as well as to make informed decisions on project tasks. From a managerial perspective, there was a need to balance the number of process checks with the need to deliver work to customers.
3. **Prioritizing Opportunities.** The organization lacked a prioritization and resource allocation process to address new opportunities arising throughout the year. The management team required a method to assess an opportunity in the context of its ability to better accomplish a strategic shift, to challenge the shift, or to suggest the need for a new strategic shift. Along with this, the organization required a method to keep track of important opportunities that may be better addressed at another time.

Without addressing these three problem areas, the shifts would risk being unclear to KLS customers as well as KLS staff.

3.3. *The Approach*

The original approach included everyone in strategy formulation, goal setting, and status review. The new approach incorporated collective reflection on predicted trends and in the evaluation of new ideas. The new approach required the development of a collective intelligence process and an opportunity management process. It called for a new planning process by which individual work was assigned to roadmaps and then back to strategic objectives. It necessitated a mechanism by which to connect each of the three processes together in timely and effective ways.

An overview of the process before the changes is diagrammed below.

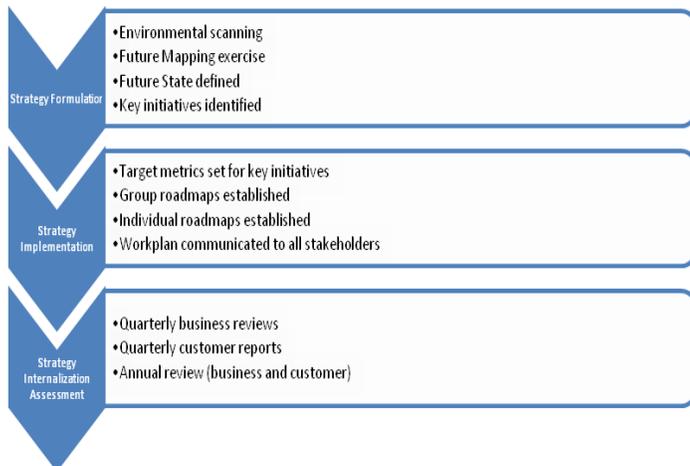


Fig. 1: The traditional, three-tiered Strategy Management Process. Source: KLS

The identified needs for change required KLS to implement a dynamic approach that integrated the traditional strategy formulation, implementation and assessment with processes designed to manage collective intelligence of the organization and new opportunities. The overall process is depicted below in Figure 2.



Fig. 2: Strategy Management Process integrated with the Collective Intelligence and Opportunity Management Processes. Source: KLS

In the new approach, the department continues to use the Future State developed by the entire organization. The Future State is static and depicts a picture of the organization at the end of three years. The annual roadmaps are developed based on learning from the Collective Intelligence processes that occur throughout

the year, and the adoption and identification of new opportunities. Investments in products, services and projects are assessed each quarter, and can be challenged formally each week at the Senior Management meeting. Products, services and projects are assigned to one of four practice roadmaps. Individual assignments, and therefore individual goals, are documented in an organization-wide work grid. Any change to a product or service can be brought up at a team or unit meeting. If resources are required from more than two units, change requests can be presented any week to the Senior Management Team as part of the Opportunity Management process. Given that change can and does happen, an Opportunity Management process is available to review new ideas and change requests against a set of criteria that reflect both the documented strategy framework and the known collective intelligence. The Opportunity Management process stewards prioritized ideas and cross-organization change requests through assessment, development, and as appropriate, implementation. Revisions are made immediately to individual goals and are documented on roadmaps each quarter. Yearly outcomes are used to inform the development of new annual roadmaps. A new Future State is developed every three years.

Figure 3 below presents the types of supporting tools used to enable the process. In all cases KLS leverages the authoring and collaborative tools existing within the organization already. KLS introduced commonly used social tagging tools as well as a commercial prediction market tool that had seen significant exposure and success. The decision as to which tools to use was based on the need for seamless integration with already existing tool skills, and the insurance that technical support would be readily available.

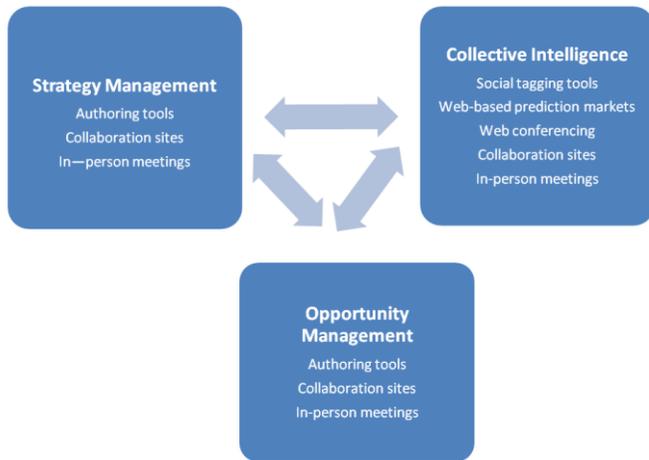


Fig. 3: Tool types used in the new approach. Source: KLS

The changes made in 2009 ensured that adjustments can be made when work requires resources from across the organization, and helped each staff member to understand how their work impacts the shifts. An explanation of the changes to address the three focus areas follows in the next section.

3.3.1. Focus Area One: Leveraging Collective Intelligence

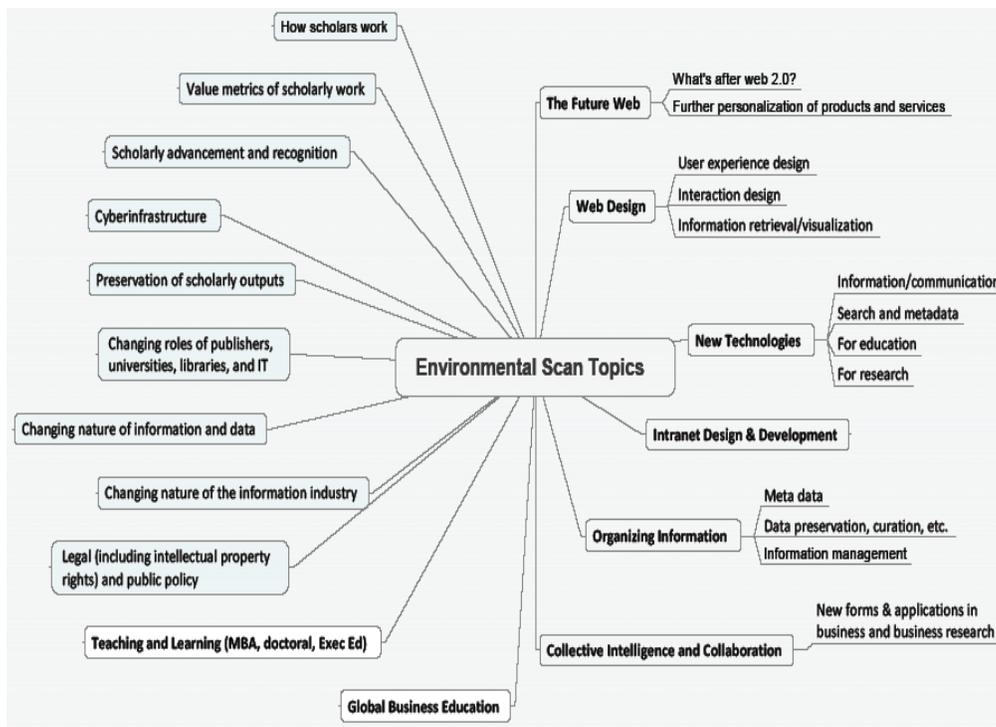


Fig. 4: The 2009 Environmental Scan themes. Source: KLS

While the quarterly roadmap review process ensured that staff members knew whether they were doing the right things, they lacked clarity on the larger picture, that is, whether the strategy still made sense. We chose four activities to leverage our collective knowledge.

1. **Social tagging and trend analysis.** Important themes in the Future State were identified for ongoing tracking as part of a social tagging effort and trend analysis.
2. **Trading in prediction markets.** Specific key events or ideas were assessed through the implementation of prediction markets.
3. **Challenging the strategy** through individual roadmap discussions, management reviews and group reflection.
4. **Creating a path for ideas to become new products and services.**

The first two activities were managed through the KLS Environmental Scan Program. The topics of the scan represent main themes and priorities expressed in the Future State. See the illustration below.

chose to add one more explicit opportunity to challenge the strategy—they engaged the full staff in a mid-year review of the key trends, requesting that it a) confirm whether the trends were or were not the most important ones to continue to follow and b) identify any new steps that should be taken to address the trends in the work.

With the advent of the financial crisis the SMT reconfirmed a commitment to the Future State. The strategic shifts were reconfirmed with the Governance bodies. The management and team lead planning process reviewed each and every product in the context of the strategic shifts. Individual task assignments to a work grid reflect the serious review given. Individual goals are developed based on the work grid, which is tied

to the four practice areas (Research and Course Support, Information Products and Knowledge Dissemination, Information Management, and Content Sourcing), and the four practice roadmaps are tied to the strategic shifts. All explicit documents are used in establishing individual goals. Each individual in KLS was a critical contributor to the decisions made on fiscal year deliverables. The Strategy received a thorough review. Time will tell whether the staff have the same challenges in identifying their work with it.

The documents put in place to manage strategy changes up, down and across the organization are depicted in Figure 6.

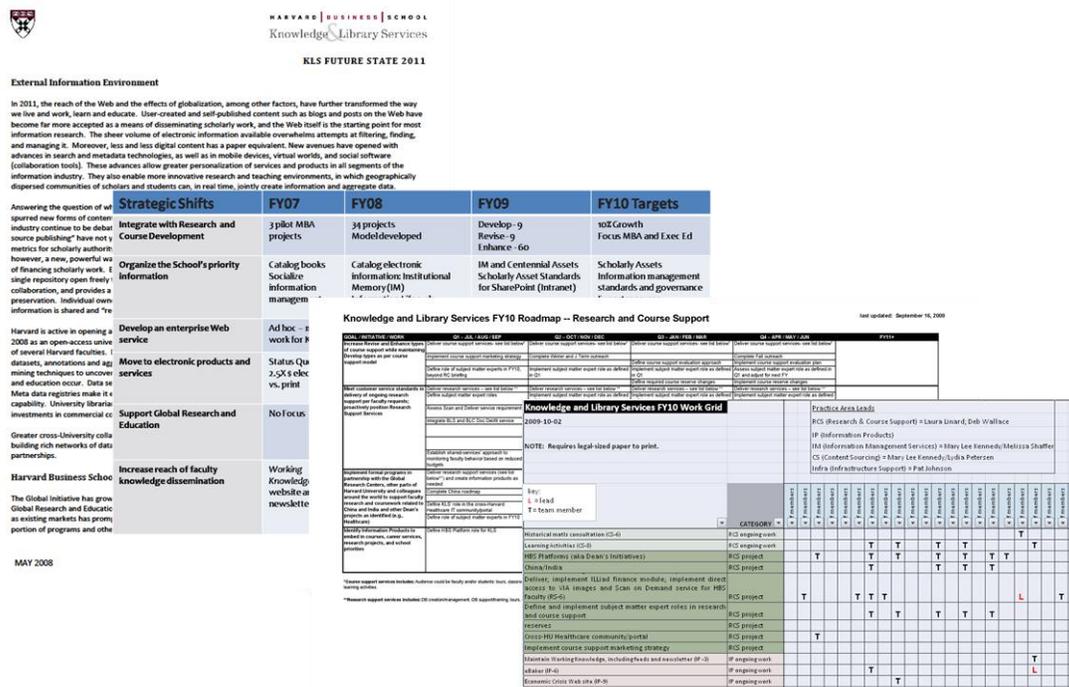


Fig. 6. Documents that connect individual work to the Future State. Source: KLS

3.3.3. Focus Area Three: Prioritizing Opportunities

One of the greatest challenges was to prioritize and act on new ideas in a timely manner, especially when the work required resources from more than two groups. The goal was to mitigate two extremes: every idea was a good idea, or no idea could be addressed given existing priorities. Neither extreme provided the desired

customer experience – a seamless provision of services and products which reflect both customer needs and ongoing innovation.

With more collective assessment occurring via the trends analysis, the prediction markets, and the group reflection, ideas were evaluated as opportunities and implemented by managers and their groups whenever they were

considered to be significant contributors to the strategic shifts. At the local level managers had been given a list of the six strategic shifts and could use that to inform their decisions. . The assessment of opportunities restricted to one group was understood to work fine. When two groups needed to collaborate on a product, service or project they were expected to sort out resource allocations themselves, again measuring the idea in the context of it contributing to one of the strategic shifts.

Recently, KLS had implemented a project management practice. More and more work was requiring resources from across the organization. The nature of the work had changed, in itself a reflection of the strategic shifts. The Senior Management Team decided on a formal sign-off for cross-organizational resources. A set of criteria was defined for idea escalation and resource allocation in order to determine the type of investment to make in developing an idea into a product or service. The criteria were documented, posted to a collaboration site, and communicated to every team lead and manager. The first gate for an idea to pass through is an informal discussion between the individual with the idea and their manager.

The individual is asked to answer one question—can they convince their immediate manager that the new idea will make a strategic change or not? That is, is it really an opportunity or just another interesting idea? The second gate requires the idea generator to put together a written proposal for review by the Senior Management Team that defines the opportunity’s impact on the achievement of one of the strategic shifts. The set of questions in the second phase includes:

- Is the idea related to a key customer request (e.g., the Dean)?
- Is the opportunity strategic or operational? Why?
- Is there an impact on the Balanced Scorecard? Why? What does it look like?
- Is it a new area that no one else within the School organization (or even outside of the School) should be doing? And why?
- Given the work we do today, what would be the effect of not doing it now?

A diagram reflecting the Opportunity Management process is noted below:

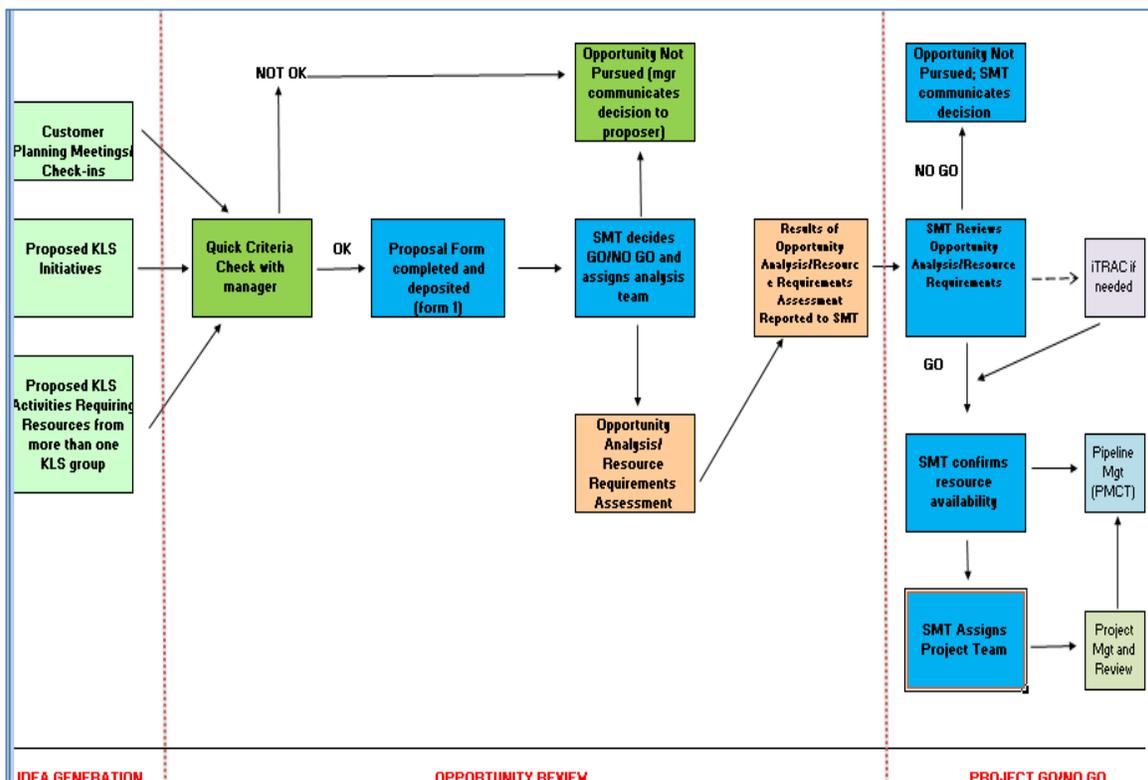


Fig. 7. Opportunity Management process. Source: KLS

4. Lessons Learned and Practical Implications

After one year, KLS reviewed the new process approach in the context of the three initial focus areas. The result of the assessment is noted in Table 1.

Focus Area	What is Working	What is Not Working
Leveraging Collective Intelligence	<ul style="list-style-type: none"> The social tagging and trend analysis motivated individuals to learn about areas important to our strategy Given the wealth of information on any of the topics, it would have been impossible to monitor them without collective effort We have changed our work based on new trends identified in this process Our staff can carry out informed discussions about the primary trends we have identified, and articulate how they affect their work 	<ul style="list-style-type: none"> Social tagging is popular among some but not all staff members; this and the moderating of tagged sources can bias the results. Trend analysis outcomes still need to become an integral part of the individual’s review of work deliverables (it is only halfway there with group discussions) There are too many topics to monitor given the resources available While many staff members enjoyed the fun of prediction markets, there wasn’t enough trading and information seeking activity to merit the investment. Additionally, the resulting predictions did not impact our work as directly as we would have liked
Challenging the Strategy	<ul style="list-style-type: none"> Cross-group discussions on whether the strategy makes sense were very well informed and resulted in adjustments Group and individual roadmaps provided another great opportunity for strategy discussions 	<ul style="list-style-type: none"> We need to continue to communicate and act in a way that empowers the staff to make changes in order to achieve the strategic objectives
Prioritizing Opportunities	<ul style="list-style-type: none"> There was a lot more clarity as to whether an idea was worth developing further or not 	<ul style="list-style-type: none"> There still seems to be a need for staff to understand the cross-organizational resources required to do the work

Table 1. Focus area assessments post new approach.

As a service organization, KLS has to be responsive to changes in the customer environment – the needs of the faculty, students and staff and the very nature of research and learning brings continuous change. In light of the global economic climate, attention has to sharply focus on a few strategically essential areas and on making responsibility for strategy implementation a part of everybody’s work. To do so requires those directly responsible for leading work across the organization are engaged in prioritizing the products, services and new projects. In consultation with their team members they will identify and ensure that the expertise, time, and tools

are aligned with the commitment made to the practice areas and strategic objectives.

The environmental scan themes need to be prioritized and this will be the task of the SMT. The organization will focus on fewer topics to monitor while remaining porous to emerging themes from unexpected avenues. Topics will be assigned to topic experts responsible for developing a whitepaper that outlines the evidence for any trends or disruptive elements, and possible impacts on the products, services or project work. The broader organization will continue to be engaged in tagging. Each

individual roadmap will include explicit communication showing the relationship of their tasks on projects, products, and services, including “ongoing work” with the annual practice roadmaps and the strategic shifts.

The addition of a group-wide work grid that assigns individuals to specific products, services, and projects, and then ties the work grid back to the four practice areas (which are tied to the strategic objectives) is critical to connecting the dots for each staff member. Each staff member will be encouraged to challenge the strategy and their relationship to it either with their local manager, or with a member of the Senior Management Team. Each team lead and manager will be required to check in with their staff each quarter as to whether they have questions about how their work is related to the strategic shifts. The Senior Management Team is introducing a new communication mechanism to ensure the documentation relating to the strategic shifts and associated individual deliverables is clear and easily accessible. Collaboration sites are being implemented where individuals can work on products, services, and projects virtually, and refer back to reference documentation.

The KLS leadership wants to encourage creation and, as appropriate, implementation of new ideas. Some thought will be given to an internal idea or innovation marketplace where those with a problem can seek problem-solvers. This may also help to broaden the understanding of the cross-group and cross-university needs to collaborate. The SMT will continue to test the criteria for idea selection to make sure the criteria do support the development of important opportunities. Decision-making on local opportunities will be left to local groups and their managers. Wherever such a decision changes a deliverable on a practice roadmap, the change will come to the SMT for discussion and confirmation. Cross-organizational resource allocation will follow the Opportunity Management process.

Without a doubt, the majority of the organization understands the shifts that have taken place, and most believe their role matters in creating that shift. The economic crisis actually assisted with driving home the relationship between individual work and strategy by requiring everyone in the organization to be very conscientious about how the limited resources are employed. There are still individuals who delegate

strategic understanding to others. This may be due to the organization being a unit within a larger organization (and in essence hidden behind the “safe” parent organization). Perhaps the relevance of strategy is weakened in this context.

Conclusion

Even the best strategy is of no value if employees cannot relate to it in their daily work. The paper illustrated how Harvard Business School’s Knowledge and Library Services (KLS) integrated a traditional strategy management process (i.e. formulation, implementation and assessment) with collective intelligence and opportunity management processes in times of major strategic shifts and economic changes.

Supplementing proven strategy tools, such as future mapping or sense making, KLS used social tagging, trend analysis and prediction markets to benefit from the cognitive diversity of its employees in scanning its environment. The results of the scan, together with other forms of group reflection, became important in assessing or challenging the KLS strategy. The leadership of the organization also saw an urgent need to manage the process of turning ideas into new products and services. Such process ensured that new ideas were registered, evaluated and quickly became new customer offerings.

The new process resulted in a change in how the work of the organization is planned, assigned and reviewed by changing from departmental roadmaps to practice area roadmaps more clearly aligned with strategic objectives. Individual work, as noted on a work-grid is very easily noted in the context of practice areas, related products, services and projects.

The new process approach revealed two important lessons. Harnessing collective intelligence and cognitive diversity is not an easy task; there is much to learn how to do it in meaningful ways in organizations. Finding the right balance between formal and informal, structured and emergent elements of strategy will remain another great challenge, while keeping focused on the tasks at hand and ensuring they are the ones that matter the most to customers.

References

- Ambrosini, V., & Bowman, C. (2001). Tacit knowledge: Some suggestions for operationalization. *Journal of Management Studies*, 38(6), 811-829.
- Beer, M., & Eisenstat, R. A. (2004). How to have an honest conversation about your business strategy. *Harvard Business Review*, 82(2), 82-89.
- Bjelland, O. M., & Wood, R. C. (2008). An inside view of IBM's 'Innovation Jam.' *Sloan Management Review*, 50(1), 32-40.
- Bonabeau, E. (2009). Decision 2.0: The power of collective intelligence. *Sloan Management Review*, 50(2), 45-52.
- Choo, C. W. (1995). *Information management for the intelligent organization: The art of scanning the environment*. Medford, NJ: Information Today, Inc.
- Choo, C. W. (2006). *The knowing organization: How organizations use information to construct meaning, create knowledge, and make decisions*. New York: Oxford University Press.
- Chui, M. (2009). Six ways to make web 2.0 work. *McKinsey Quarterly*, (2), 64-73.
- Cogwill, B. (2008). *Using prediction markets to track information flows: Evidence from Google*. Retrieved August 10, 2009, from <http://www.bocowgill.com/GooglePredictionMarketPaper.pdf>
- Collis, D. J., & Rukstad, M. G. (2008). Can you say what your strategy is? *Harvard Business Review*, 86(4), 82-90.
- Deering, A. (2008). Internet tools enable organizational transformation from the inside out: The Nokia Siemens Networks case. *Strategy and Leadership*, 36(5), 34-37.
- Doz, Y., & Kosonen, M. (2008). The dynamics of strategic agility: Nokia's rollercoaster experience. *California Management Review*, 50(3), 95-118.
- Gadiesh, O., & Gilbert, J. L. (2002). *Transforming corner-office strategy*. HBS on Advances in Strategy. Cambridge, MA: Harvard Business School Publishing.
- Hahn, R. W., & Tetlock, P. C. (2006). *Information markets: A new way of making decisions*. Washington, DC: AEI-Brookings Center for Regulatory Studies. Retrieved August 10, 2009, from <http://aei-brookings.org/admin/authorpdfs/redirect-safely.php?fname=../pdffiles/phpoY.pdf>
- Hamel, G. (2007). *The future of management*. Cambridge, MA: Harvard Business School Press.
- Hanson, R. (2003). Combinatorial market design. *Information Systems Frontiers*, 5(1), 107-119.
- Ho, T-H., & Chen, K-Y. (2007). New product blockbusters: The magic and science of prediction markets. *California Management Review*, 50(1), 144-158.
- Johnson, L. K. (2007). Sense in strategy communication: Four lessons from Canon USA. Balanced Scorecard Report Article.
- Kaplan, R. S., & Norton, D. P. (2008). *The execution premium: Linking strategy to operations for competitive advantage*. Cambridge, MA: Harvard Business School Press.
- Kaplan, R. S., & Norton, D. P. (2006). *Alignment: Using the balanced scorecard to create corporate synergies*. Cambridge, MA: Harvard Business School Press.
- Kaplan, R. S., & Norton, D. P. (2004). *Strategy maps: Converting intangible assets into tangible results*. Cambridge, MA: Harvard Business School Press.
- Kurtz, C., & Snowden, D. (2003). The new dynamics of strategy: Sense making in a complex complicated world. *IBM Systems Journal*, 42(3), 462-483.
- Li, C., & Bernoff, J. (2008). *Groundswell: Winning in a world transformed by social technologies*. Cambridge, MA: Harvard Business School Press.
- Mason, D. H., & Wilson, R. G. (1987). Future mapping: A new approach to managing strategic uncertainty. *Strategy & Leadership*, 15(3), 20-29.
- NerveWire. Overview of future mapping process. Retrieved August 10, 2009, from <http://www.ofcom.org.uk/static/archive/ra/topics/convergence/document/mappingfuture/workshop2001/futuremapprocess.pdf>
- Norton, D. P., & Coffey, J. (2007). Building an organized process for strategy communication. Balanced Scorecard Report Article.
- Okhuysen, G. A., & Eisenhardt, K. M. (2002). Integrating knowledge in groups: How formal interventions enable flexibility. *Organization Science*, 13(4), 370-386.
- Page, S. E. (2008). *The difference: How the power of diversity creates better groups, firms, schools and societies*. Princeton, CA: Princeton University Press.
- Pennock, D. M., & Sami, R. (2004). Computational aspects of prediction markets. *Journal of Economic Perspectives*, 18(2), 107.

Raynor, M. E. (2007). *The strategy paradox: Why committing to success leads to failure (and what to do about it)*. New York: Broadway Business.

Snowden, D. J., & Boone, M. E. (2007). A leader's framework for decision making. *Harvard Business Review*, 85(11), 68-76.

Weick, K. E. (2001). *Making sense of the organization*. Oxford, UK: Blackwell.

Wolfers, J., & Zitzewitz, E. (2006). Prediction markets in theory and practice. Research Papers 1927. Stanford, CA: Graduate School of Business, Stanford University.

Appendix: KLS Future State 2011

External Information Environment

In 2011, the reach of the Web and the effects of globalization, among other factors, have further transformed the way we live and work, learn and educate. User-created and self-published content such as blogs and posts on the Web have become far more accepted as a means of disseminating scholarly work, and the Web itself is the starting point for most information research. The sheer volume of electronic information available overwhelms attempts at filtering, finding, and managing it. Moreover, less and less digital content has a paper equivalent. New avenues have opened with advances in search and metadata technologies, as well as in mobile devices, virtual worlds, and social software (collaboration tools). These advances allow greater personalization of services and products in all segments of the information industry. They also enable more innovative research and teaching environments, in which geographically dispersed communities of scholars and students can, in real time, jointly create information and aggregate data.

Answering the question of who owns the information on the Web has been trailing behind the technologies that have spurred new forms of content creation and use. The forms of copyright-based ownership model of the publishing industry continue to be debated within the scholarly community. New attempts to regulate and standardize “open-source publishing” have not yet taken firm hold, nor has academic recognition of new forms of publishing to include in metrics for scholarly authority and attribution. Peer-reviewed publications still drive the U.S. scholarly infrastructure; however, a new, powerful wave of open-access peer review is gaining strength across the globe, pressing for new forms of financing scholarly work. Europe is embracing the open-access model by centralizing institutional publications in a single repository open freely to all European universities. Such universal access encourages global research and collaboration, and provides a forum for questions of intellectual property rights, collection policies, and archival preservation. Individual ownership of intellectual property continues to be complicated by the ease with which information is shared and “re-purposed.”

Harvard is active in opening access to scholarly research results. The Office of Scholarly Communications, established in 2008 as an open-access university-wide institutional repository, is capturing a significant percentage of scholarly output of several Harvard faculties. Discussions now focus on the inclusion of new forms, such as simulations, software, datasets, annotations and aggregates thereof. In various pockets, the University already leverages text analysis and data mining techniques to uncover information patterns and research trends, particularly where interdisciplinary research and education occur. Data sets created in the research process are now available alongside the analysis and findings. Meta data registries make it easier to find the information, although a managed repository is seen to increase this capability. University librarians are examining the appropriate modes of research support, trying to balance their investments in commercial content against “in-progress” online-only resources created by scholars.

Greater cross-University collaboration and integration has resulted in new joint degree programs. The University is building rich networks of data and people, and firms hungry for innovation are joining through new forms of cross-sector partnerships.

Harvard Business School (HBS)

The Global Initiative has grown and thrives. It includes efforts such as the Global Database on International Business and Global Research and Education Centers. The growth in demand for management education in new and emerging as well as existing markets has prompted HBS to establish classroom facilities in China, India and Europe, supporting a small portion of programs and other HBS activities. Research initiatives in healthcare management and the sciences, as well as in social enterprise, leadership and entrepreneurship continue to grow and deliver significant new knowledge for those involved. January Immersion Experiences supplement on-campus education by providing practical “immersion” in academic, cultural, and corporate-or organization-based fieldwork around the world.

Blended learning and lifelong learning communities have created strong networks connecting faculty and practitioners. MBA programs are hands-on and especially in the EC year, experimental, with a growing number of students cross-registering into the MBA program to

“build their own” joint degree programs, notably in engineering and life sciences; new dual degree programs have been created for business/real estate, business/urban planning, business/education and business/public health. The doctoral programs have intensified efforts to increase the number of scholars who are prepared to join the faculty. Through all of these programs, the alumni remain active and even more involved in HBS teaching and learning.

At HBS, faculty remains focused on teaching and research. Case-based teaching remains the defining characteristic of HBS, enriched through the use of new information technology and social software. The impact of faculty’s research is measured increasingly in ways that reflect the collaborative and dynamic digital nature of knowledge creation and dissemination evident in the sciences. eResearch, particularly in interdisciplinary and global work, is the preferred mode for many of the younger faculty members.

New types of students have entered our doors, in part due to the HBS 2+2 Program and a new fellowship program. The MBA class of 2011 includes more students who have work experience in world-class, knowledge-based science and engineering organizations, and are accustomed to employing a full spectrum of cutting-edge IT technologies. They prefer to work collaboratively and expect information to be easily accessible. HBS has responded to student’s changing expectations by offering Web-based tools, video cases, simulations and virtual communities in the classroom. This working environment seems to be preferred by young faculty and doctoral students as well. Executive Education participants have varying comfort levels with new learning technologies; new programs adopt similar technologies and approaches popular in the MBA.

Knowledge and Library Services (KLS)

KLS is a team of experts passionate about its mission, collaborative, innovative, service-oriented and accountable to its customers, partners, and team members. It is committed to the School’s values and to the importance of lifelong learning. Success requires spanning disciplines, risk taking, flexibility, innovation, and transparency. Success also requires reflection, evaluation, critical thinking, and knowledge sharing, as well as meeting expectations through planning, program and project management. KLS team members recognize

the value of partnering with each other and with other organizations in the design, development and delivery of products and services. Strategic partnerships with ITG and with Marketing and Communications have delivered significant value to HBS. KLS is a meritocracy where collaboration, knowledge sharing, team work, idea exploration and delivering on commitments are recognized and rewarded. Within the realities of the economic environment and given the dynamic nature of the information industry, KLS tests what is core and non-core to its customers, and adjusts its products and services accordingly. Customers working around the globe benefit from services available virtually 24 X7, and from staff, as appropriate. The powerful combination of process, technology, information and expertise ensures that the integration of our work continues to deliver the support needed for world-class teaching and research.

Through its own work and the advisory role it provides to others, KLS supports the full cycle of knowledge creation, information management, presentation and information and knowledge use. True to its mission, KLS’ impact is best reflected in the ease with which multiple types and disparate sets of unique information, ideas and expertise are used to support HBS’ research and educational objectives. It is this uniqueness and multi-disciplinary expertise that puts HBS at an information advantage over others.

KLS leads its peer organizations in innovations in Scholarly Communications, knowledge asset management, Web and Intranet design and development, and the application of deep subject and information expertise in support of global business research and education. KLS champions new collaborative approaches to research and knowledge sharing; it has created its first multidisciplinary Knowledge Commons and a prediction market that aggregates knowledge of information professionals about future trends in the information industry. Along with its strategic partners, KLS has completed the 2009 initiative to build a 2.0 version of the Intranet and the Web for HBS. KLS continues to experiment with new methods of knowledge sharing, such as creating targeted, web-delivered, content “databases,” expressly designed for user exploration and research, including end-user tools for linguistic analyses. Successful examples include the ongoing Institutional Memory program and next-generation Working Knowledge products.

KLS' customers (faculty, students, alums, staff and business practitioners) recognize our high standards of quality and expertise in designing the user experience, supporting the development of courses and curricula, supporting the creation of new knowledge through research, and in developing, managing, and disseminating authoritative information and data products in a world marked by a deluge of digital content. KLS products and services span research and course support, knowledge and information access, information management, Web development and knowledge sharing.

Since 2008, KLS has developed advanced capabilities in data and digital content management, program management, web "interaction design," and information retrieval and visualization. Our capabilities in product management and information research are now mature. In terms of data management, KLS professionals include experts in knowledge asset management, data preservation and curation, text mining and other forms of large data set analyses. KLS has partnered with DRFD to create a global, collaborative network of information, archives and data sets on international business. KLS chairs the governance of information and knowledge asset management at HBS.

Strong project and program management skills as well as deep subject expertise and knowledge of the audience requirements ensures the integration of our expertise into the primary processes of HBS, including course development, research, learning and administration. KLS programmatically supports the enhancement, revision and development of new courses and educational programs. Under the program leadership of KLS, and in partnership with ITG and M&C, the Web and Intranet now deliver a world-class experience aligned with key HBS processes, giving staff, students, and faculty a competitive advantage. HBS recently won awards for the world-class user experience.

The KLS Web development experts now have very strong interaction design and information retrieval/visualization expertise. Personalization prevails. Our customers have now full access to HBS Web and Intranet resources on mobile devices; they can easily interact with and search across HBS applications and Web properties, including locating and using knowledge assets available anywhere. KLS is well-positioned to continue to lead in knowledge and information services for the next decade, having taken an approach to innovation based on rigor and discipline, strategic partnerships, focused on the customer and the HBS priorities.

Mary Lee Kennedy is Executive Director of Knowledge and Library Services. The group is responsible for enabling the exchange of ideas, expertise and information in support of research and teaching at Harvard Business School. She oversees four practice areas: Research and Course Support, Information Management, Knowledge Dissemination, and Content Sourcing. Prior to Harvard Mary Lee led global knowledge management teams at Microsoft Corp. and Digital Equipment.

Malgorzata (Gosia) Stergios is a Knowledge and Information Programs analyst at Harvard Business School Knowledge and Library Services (KLS). She conducts an environmental scan of the information industry and pilots innovative information products and services at KLS. Before joining KLS, she held knowledge management positions at Mercer Management Consulting and the Andersen Consulting/Accenture Institute for Strategic Change.