

## ***Inside KMPro Journal***

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### ***The Knowledge Management Professional Society***

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### ***Journal of the Knowledge Management Professional Society***

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#### ***Contributions***

For more information about contributing to the Journal,  
please see pages 47 and 49.

## FROM THE EDITORS – JOURNAL DIRECTIONS

By Mary Lee Kennedy and Deb Wallace

Welcome to the second issue of the Journal for 2008 and the first issue for us as co-editors. When we read “the call” for a new Journal editor, we decided to expand our current collaboration as partners in TKG Consulting LLC, colleagues at Harvard Business School, editor/contributors to *Intranets for Info Professionals* (Info Today 2007), friends who enjoy exploring the New England countryside, and firm believers in Aristotle’s tenant that “the whole is greater than the sum of its parts” – the power of collective/networked intelligence.

As co-editors, we have the opportunity to bring together our networks of colleagues that represent several aspects of this diverse KM community (i.e., Mary Lee from the strategic management of knowledge, including information systems and the Web-world perspectives and Deb from the organization learning and capability development perspectives).

Given that The KMPRO Journal site is in the top five pages for initial access to the KMPRO portal and the readership is a diverse range of academics, practitioners, and researchers – with no significant common background, education, or work experience, we have quite a challenge in meeting your expectations and needs.

Here’s what we propose as the future direction of The Journal:

**Purpose Statement:** The Journal’s core purpose is to help its readers and KMPRO Society members understand the work of knowledge management in the context of four key focus areas as identified in Khurana’s discussion of professional communities:

- Shared expert knowledge
- Standards of practice
- Value creation and contribution to the organizations in which the practitioners work
- Norms of conduct.

(See Khurana, R. 2007. *From Higher Aims to Hired Hands*. Princeton University Press.)

**Audience:** The journal aims to appeal to a broad, international KM audience with a primary focus on practitioners.

**Format:** As new editors, we will continue with the current format as a downloadable object from the KMPRO portal site at <http://kmpro.org/static.php?file=journal.htm>. However, the goal is to move it to a more dynamic, reader-generated information source where content is contributed on a more frequent basis, reflecting current organizational challenges and highlighting value-created based on practitioner insights.

**Content:** Primarily the content should further our knowledge about KM theory and practice, with an emphasis on practice and a practitioner’s perspective on the value KM provides in a wide range of organizations. It should provide current awareness of KM professional development opportunities and approaches.

Each issue will include content aligned with the framework components outlined in the purpose statement within the following “sections”:

- Editors’ Column

- New Knowledge – key themes and overviews of conferences presentations and proceedings
- Article(s) on KM concepts/theory (thought leadership and research)
- Practitioner case studies – in depth and thumbnail combination
- KM information on the Web -- new key resources (with commentary from the author/originator)
- KM vocabulary.

We encourage you to give us your feedback on the proposed direction for The Journal. We also encourage you to identify topics, themes, industry trends, etc. that you'd like to see covered in future issues. Propose a challenge that you'd like input on from our wide range of readers. Share your expert knowledge – your insights gained from experience when creating organizational value from a knowledge transfer or sharing initiative. Offer advice on norms of conduct for knowledge management professionals. Report on your research findings in the exploration of KM principles and concepts.

We are looking for a wide range of content – from an idea to a fully realized research article. Please submit your thoughts to [editor@kmpro.org](mailto:editor@kmpro.org).

### In This Issue

This issue continues former editor John Girard's practice of representing a global KM perspective. The contributions represent thought leadership based in practice and research from Canada, South Africa, and the United States. The contributors also represent the diverse membership of KMPro – practitioners, academics, and consultants working in KM and related fields.

In the first article, Jerry Julian presents his research on learning opportunities for

effective KM in project-based organizations. He sets the context with an integrative look at the literature from business management, knowledge management, and organizational learning, outlines barriers and enablers to knowledge transfer, and offers recommendations on how knowledge management professionals can help their organizations learn from past project experiences by focusing on creating value, not simply following prescribed procedures.

Kurt April and Victor Katoma provide a report on their research findings and propose a Discretionary Effort model. Their work helps us understand the untapped potential of employees to contribute to the challenges of sustaining and growing business in this current economic climate. Through statistical modeling, they identify variables that form a framework that encourages organizations to take a more systematic look at performance measures related to the contribution of discretionary effort rather than merely urge employees to do more.

In a thought-leadership piece, Hubert Saint-Onge challenges us to change our thinking about knowledge as *a finite resource that is captured in containers and made available through repositories* (a primary reason that most KM initiatives have failed in the past in his opinion). He outlines a strategy where knowledge is an infinite resource that is constantly generated through collaboration and suggests an approach to leverage technology in a more productive way to enable constant capability development, which in turn, creates a competitive advantage for organizations.

The issue concludes with a summary of themes discussed at the recent KM World and Intranets Conference 2008 by program chair Jane Dysart. As expected, the multifaceted nature of KM resulted in

numerous threads, but a key theme focused on the networked organization's ability to connect people together rather than collecting documents.

Throughout the articles in this issue, we see a similar theme – the focus of KM strategy and practice on connecting people, the value created through learning and knowledge sharing and the role that technology plays in enabling effective collaboration.

We look forward to working with your ideas and experiences in preparation for the next issue.

### **About the Editors**

#### **Mary Lee Kennedy, MLS**

Mary Lee has global leadership experience in multinational corporations, governments, and higher education. She specializes in the formulation and implementation of practical information and knowledge strategies that deliver organizational and performance success. She achieves this through strategy development and business planning, product and service portfolio creation and alignment, organizational capability planning and alignment, business process improvement, cross-organizational engagement and relationship management, information and knowledge identification and integration,

and effective and efficient information technology application. In addition to leading knowledge and information projects and operations in North America (Canada, the U.S. and Mexico), Mary Lee has led projects in the U.K., France, and China. She is an experienced practitioner with significant expertise in high technology, professional services, research, manufacturing, and academia. She recently edited *Intranets for Info Pros* (Information Today, 2007).

#### **Deb Wallace, PhD**

Deb has held a variety of positions in the private and public sectors, but the central theme in all her work has been building capabilities and putting them to work. Deb speaks widely on knowledge and learning in the workplace, has authored numerous articles on organizational learning, and co-authored *Leveraging Communities of Practice for Strategic Advantage* with Hubert Saint-Onge (Butterworth-Heinemann, 2003). She continues to research the role of collaboration and communities in building knowledge and has assisted numerous organizations with their strategic planning, community development, and knowledge sharing initiatives.

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## ABOUT KM PRO

The Knowledge Management Professional Society (KMPro) is an international professional society headquartered in the Washington, D.C. area and is the world's largest KM society with more than 120,000 members in 88 countries world-wide. It is a non-profit, member-driven community committed to promoting knowledge management (KM) worldwide, with membership available for those interested in KM.

We are a society created by KM Professionals and for KM Professionals actively engaged in KM implementation, Change or Information Management, Innovation, Human/Intellectual Capital Strategy, Intangible Asset Valuation. KMPro welcomes both those new to KM and experienced practitioners.

We serve the professional needs of the broad KM community through a variety of training, collaboration, networking, mentoring, partnerships, publishing, advertising opportunities. We also offer our CKM® certification graduates with the opportunity to collaborate and network.

We are 100% member-driven, locally and globally, working together to invigorate the KM community. KMPro is an INCLUSIVE organization, and one of our goals is to form strategic alliances and partnerships with those organizations who share our vision, ethics, values and beliefs. We openly seek and promote collaboration with other organizations when such a partnership would provide benefit to our members and would support our vision.

In support of our goals to advance KM and professionalism in the field of KM, KMPro offers opportunities for KM certification, career assistance and networking.

KMPro is the leading certifying body and largest international association dedicated to knowledge management and its Knowledge Management Certification Board (KMCB)® was formed in 1999. In support of our goals to advance KM and professionalism in the field of KM, KMPro offers opportunities for KM certification including the Certified Knowledge Manager™ (CKM®) certification, as well as the Certified Knowledge

Management Professional (CKMP)™ and Master Certified Knowledge Management Professional (MKMP)™ certifications. KMPro has also begun work on establishing its KM certification at the organizational level with its new "Certified KM Organization" (CKMO)™, and its international KM organizational award program will begin in 2008. Hudson Associates Consulting, Inc. is the sole provider of the Certified Knowledge Manager™ (CKM®) for KMPro and is the originator of the CKM® program and the owner of the trademark.

Members also have access to our KMPro Career Center where members can post resumes, and organizations seeking to hire those with KM expertise can post KM job listings which are made available via our KM-Jobs listserv. We're in the process of conducting the world's first global KM Salary and Benefits survey, and will publish those results once the survey is complete.

Networking and collaboration opportunities are available through member only chapter meetings (80+ chapters worldwide), events, online activities, KMPro's LinkedIn Group, and exclusive Certified Knowledge Manager™ (CKM®) Network.

For questions concerning membership, contact the VP of Member Services at [membership@kmpro.org](mailto:membership@kmpro.org). For questions regarding our training services, please contact your Certification Coordinator at 866-31-KMPRO (866-315-6776) Outside U.S. 757-460-6500, or [training@kmpro.org](mailto:training@kmpro.org)

Our purpose is to encourage the practice of knowledge management, reflect the diversity of thought found in this growing field, and disseminate the best ideas and tools from the many disciplines that facilitate organizational learning and improvement.

KMPro is incorporated within the State of Maryland, and is governed by its laws. Our Governance webpage contains our By-Laws. Ultimately we will provide available to members copies of board and meeting minutes when a secure member area is available.

## HOW KNOWLEDGE MANAGEMENT PROFESSIONALS CAN IMPROVE CROSS-PROJECT LEARNING IN PROJECT-BASED ORGANIZATIONS

By Jerry L. Julian © 2008

**Abstract:** Project-based organizations have an opportunity to leverage their project management infrastructure (teams, processes, and systems) to create a dynamic learning environment that creates value for any organization. Lessons learned and After Action Reviews are two examples of learning approaches that are widely used to varying degrees of effectiveness. Barriers to learning across projects include: the type of knowledge captured at the end of a project, the fear of public “blamestorming” that results in many formal review processes, and the tendency to defer learning to a later date that never materializes. Enablers to cross project learning include a focus on discussions between colleagues versus formal capture of “knowledge” in technology solutions and understanding the difference between product and process knowledge – the latter being the more difficult to capture, but the more valuable to the organization. KM Practitioners can play an active role in enabling cross-project learning by fostering conditions more conducive to productive reflection and effective knowledge transfer.

**Keywords:** Organizational Learning, Project Management, Communities of Practice, Lessons Learned, After Action Reviews

### Introduction

In Project organizations - including IT, product development, research and development, consulting, and engineering - face unique challenges when it comes to transferring learning and knowledge from one project to the next. Because project teams disband upon completion of their work, this often means that “the end of a project is consequently the end of collective learning” (Schindler & Eppler, 2003). As Disterer (2002) explains, there is often no “formal corpus” left where existing knowledge can be accessed once the project is over. At the organization level, this “re-inventing the wheel” represents a lost opportunity to improve performance from one project to the next (Prusak, 1997).

In project-intensive environments, quality and performance are most often defined by a project’s ability to meet established customer requirements, cost constraints, and schedule expectations (Rad, 2001). Exploiting the knowledge gained on past

projects and building on the experiences of project members to continually improve performance can improve all three of these measures, thereby improving the organization’s competitiveness (Owen, Burstein, & Mitchell, 2004).

The purpose of this paper is to provide an overview of the barriers and enablers of cross-project learning and to provide recommendations on how knowledge management professionals can help their organizations learn from project experiences in order to continuously improve from one project to the next.

### Cross-Project Learning: The State of the Practice

Having identified the problems associated with learning from projects almost two decades ago, Gulliver (1987) wrote a seminal article titled “Post Project Appraisals Pay” in the *Harvard Business Review* that describes British Petroleum’s approach to learning from one project to the

next. He states that the sole mission of the Post Project Appraisal process is “to help British Petroleum worldwide learn from its mistakes and repeat its successes” (p. 128). The process involved investigating the original intent of each project and whether or not that intent was effectively carried out.

Conducting “lessons learned” – also called project retrospectives, post-project reviews, after-action reviews, project post-mortems, and debriefings – is now an accepted standard in project management practice (Bresnen, Edelman, Newell, Scarbrough, & Swan, 2003; Disterer, 2002; Kotnour, 2000; Prencipe & Tell, 2001; Zedtwitz, 2003). Project management guidelines established by the Project Management Institute currently call for lessons learned to be captured and retained after each project is completed (PMI, 2004). Zedtwitz (2002) claims that post-project reviews are “one of the most structured and most widely applicable approaches to passing on experience from one team to the next” (p. 256).

Although the implementation of lessons learned practices differs by company and group, they often begin by engaging team members in reflective discussions about the reasons for project success or failure, almost always after completion of the project (Disterer, 2002; Kotnour, 2000). These “lessons” are then documented and stored in databases for access and retrieval by others in the organization (Newell, 2004). The objective is to “facilitate continuous learning at all levels within an organization” (Zedtwitz, 2002, p. 256), including the individual, the team and the organization.

Darling, Parry and Moore (2005) describe one such lessons learned practice - the After Action Review (AAR) - developed and implemented by the US Army and now used in part, by companies such as Colgate-

Palmolive, DTE Energy, Harley-Davidson and J.M. Huber. AARs are part of a planning and learning cycle that starts before and continues through simulated battles in the deserts of California. The cycle begins with a plan that is drafted by a senior commander of the “opposing force” and includes the task to be completed, the purpose of the task, the commander’s intent, and the expected result. These orders are then shared with subordinate commanders who, through a “brief-back,” verbally explain their understanding of the order. A rehearsal of the battle is then conducted to ensure each unit has a clear understanding of its battle plan.

The AAR meeting is most often facilitated by the unit leader’s executive officer, the second in command. The meeting begins with “a reiteration of the house rules,” which include: “Participate. No thin skins. Leave your stripes at the door. Take notes. Focus on our issues, not the issues of those above us [in the hierarchy].” (p. 88). The executive officer reiterates the original mission, intent, and expected outcome. The officer then describes the actual outcome, provides a brief review of events and reviews associated battle-field metrics that relate to the original objective.

AARs focus on improving a unit’s own learning and performance. Four questions are addressed in the AAR meeting: What was the intent? What actually happened? What caused the results? What will we sustain or improve? After the AAR is completed, Army leaders are “accountable for taking lessons from one situation and applying them to others – for forging explicit links between past experience and future performance” (Darling et al., 2005, p. 91).

Darling et al. (2005) claim that it would be impractical for companies to adopt these

processes in their entirety, yet they suggest that key aspects of the AAR cycle can be utilized to increase competitiveness and prevent the repetition of mistakes. Marsick and Watkins (1999) re-affirm the importance of AARs in the corporate setting, claiming that they can enhance the informal learning of participants through “systematic reflection and structured intervention” (p. 76). It is through these processes of public reflection, they claim, that learning can be “shared and moved to a collective level of understanding” (p. 76).

Consistent with Marsick and Watkins’ (1999) perspective on the importance of reflection for learning from experience, Raelin (2001) claims that public reflection is the key to “unlocking the learning” from project activities and is the form of reflection that can “enhance learning beyond the project (team) level to other levels of experience – individual, organization, and society” (p. 12). According to Raelin, reflection is defined as “the practice of periodically stepping back to ponder the meaning to self and to others in one’s immediate environment about what has recently transpired” (p. 11). Raelin (2001), like Marsick and Watkins (1999), claims that structured intervention must be provided in order to promote deeper levels of reflection.

### **Deployment of Lessons Learned Practices**

Despite the wide acknowledgement of the value of conducting lessons learned practices at the end of projects (Disterer, 2002; Marsick & Watkins, 1999; Raelin, 2001; Zedtwitz, 2002, 2003), researchers have found their actual use in project management practice to be mixed. In a survey completed by 62 managers from the US, Europe and Japan representing over 20 R&D organizations, Zedtwitz (2003) found

that 80% of all projects were not reviewed at all after completion and the remaining 20% were reviewed without the use of a formally structured process.

Schindler and Eppler (2003) conducted action learning research with nine multinational companies and also found that there is a “great discrepancy” between the need for project debriefing and its actual deployment in practice. Additionally, in a review of several empirical studies conducted in IT project environments, Disterer (2002) notes that “Project information is rarely captured, retained, or indexed so that people external to the project can retrieve and apply it to future tasks” (p.513).

In a study of 19 firms in project-based industries, Keegan and Turner (2001) found that all the companies in their study “without exception” had lessons learned policies in place to capture learning from projects once completed. Yet even though policies were in place to hold the reviews, it rarely happened. Worse, the authors found that “in no single company did respondents express satisfaction with this process” (p. 90).

### **Barriers to Cross-project Learning**

A review of the cross-project learning literature has yielded three important themes that represent barriers to the effective use of lessons learned practices and cross-project knowledge transfer. A description of each of these themes follows.

The first barrier to effectively deploying lessons learned practices relates to what’s actually stored on corporate intranets and knowledge management systems upon project closure and over the course of the project. Traditional project management practice typically involves checkpoints to

review “deliverables” produced by the project team for the purpose of meeting a project’s specific objectives (Kerzner, 2006; Newell, Bresnen, Edelman, Scarbrough, & Swan, 2006). Because project reviews and the completion of project work in general are highly focused on the production of deliverables, they are the artifacts most often made available for sharing (Newell, 2004). The problem is that project deliverables in and of themselves are project specific, lack context, and may be difficult for others to adapt and apply to future projects. This relates to the nature of process knowledge versus product knowledge, which will be further discussed below.

The second major barrier to the effective deployment of lessons learned practices is project members’ fears related to publicly “airing mistakes” or being blamed for problems that occurred on the project (Disterer, 2002; Prencipe & Tell, 2001; Schindler & Eppler, 2003; Zedtwitz, 2003). For example, in a study of 20 project management organization executives and how they facilitate cross-project learning, Julian (2008) found that leaders intervene to facilitate reflection on past project experiences most often when there’s a problem – when the “traffic light” status report indicates a red light. Under these “red light learning” conditions, “blamestorming” can occur, creating an environment rife with distortions and defensiveness, thus undermining the organization’s ability to learn effectively from past project experience.

The third major barrier found in the cross-project learning literature relates to the tendency to defer learning and reflection activities, if they occur at all, until the close of the project (Ayas & Zeniuk, 2001; Disterer, 2002; Keegan & Turner, 2001; Schindler & Eppler, 2003; Skovvang,

Christensen, & Bang, 2003; Zedtwitz, 2003). Keegan and Turner (2001), for example, claim that learning “in a reflective manner throughout projects is damaged by [traditional lessons learned] practices that exist to defer learning until projects are completed” (p. 93). This is also confirmed by Julian (2008), who reports that 20% of the project executives in his study expressed deferral of reflection as a barrier to cross-project learning.

### **Enablers of Cross-Project Learning**

Despite the problems associated with lessons learned practices, two themes have emerged as factors that appear to enable cross-project learning. First, it is clear that social practices, including narration and joint work among communities of practitioners, appears to be more effective than technology-based approaches involving storage, access and retrieval (Antoni, Nilsson-Witell, & Dahlgard, 2005; Bresnen et al., 2003; Newell, 2004; Newell et al., 2006; Newell & Swan, 2000; Prencipe & Tell, 2001). Even where technology is involved, organizational members tend to consult with trusted colleagues first in order to identify information that may be useful (Bresnen et al., 2003; Newell et al., 2006). Newell et al. (2006), for example, found that “the most widely cited mechanism facilitating cross-project knowledge transfer was through senior managers, who were responsible for larger programmes, serving as the conduit” (p. 174). The importance of the brokering role played by senior managers, the authors claim, stems from their broad perspective as well as their hierarchical position. As one interviewee noted, “the people that review the project frequently review many other projects and they can pass that information on to other teams” (p. 174).

Project Management Office (PMO) leaders are an example of executives who are in an organizational role responsible for overseeing multiple projects. Julian (2008) found, for example, that PMO leaders can be viewed as knowledge brokers who facilitate connections among multiple communities in order to create and transfer learning from one project to the next. They facilitate the deployment of reflective practices and embed the resulting learning into future project routines and methodologies in order to continually improve project performance.

The second enabling factor emerging from the cross-project learning literature is the conceptual difference between process knowledge and product knowledge (Antoni et al., 2005; Bresnen, Goussevskaia, & Swan, 2005; Newell et al., 2006). Process knowledge, in the context of cross-project learning, relates to processes that a team may have deployed to achieve their goals and includes the reasons why these processes were effective or why they were not (Newell et al., 2006). Process knowledge can be distinguished from “product knowledge,” which the authors define as “knowledge about what had actually been achieved in relation to the stated goals or objectives” of a project (p. 175).

Newell (2004) claims that process knowledge, although more difficult to transfer, may be more useful to other project teams as it “is likely to involve much less technical content and so will be easier for others to absorb” (p. 18). She goes on to say that “...learning from [process knowledge] may enable a team in another project to complete their own tasks more efficiently and effectively” (p. 18). Similarly, Antoni et al. (2005) claim that process knowledge “...can become a practice that can be applicable to most projects most of the time,” whereas product knowledge “can vary significantly by application area” and is

therefore less useful for a broader audience (p. 880). This may explain the problems associated with the lack of usefulness of project deliverables stored on corporate intranets.

### **Recommendations for Knowledge Management Professionals**

Given the barriers and enablers found in previous research related to cross-project learning, the question now turns to what knowledge management professionals can do to help their organizations learn from past project experiences. Four recommendations are offered, each of which is aimed at fostering conditions more conducive to productive reflection and effective knowledge transfer.

***Recommendation 1: Focus on accumulating social capital across multiple communities by establishing a network of strong relationships built on trust, professional development and mutual understanding.***

As knowledge creation and sharing requires the appropriate attention and focus among project teams, it is essential that knowledge management leaders build a strong network across communities in order to enlist support and negotiate effective knowledge management practices. Given the likely pervasiveness of defensive routines and their confounding effects on reflection and learning, it is necessary to gain the trust of organizational members by emphasizing professional development over more punitive approaches and by understanding needs of each community and their members rather than imposing practices that demonstrate a lack of understanding of their unique requirements.

***Recommendation 2: Focus equal emphasis on learning from successful projects as***

*those that appear to have failed or run off-course.*

If formal learning practices are continually focused on poorly performing projects, the organization risks enculturating learning practices as a punitive endeavor, making engaging in this process a less-than-appealing prospect for organizational members. Moreover, if learning practices are primarily focused on troubled projects, then the improvements that result in the form of organizational routines may be distorted towards eliminating risk and establishing tighter controls to prevent such problems from recurring. This may shackle future project teams with burdensome processes that limit their innovative potential. It is recommended that knowledge management professionals and other facilitators of organizational learning actively engage successful project teams in formal learning practices not only to make the learning process more effective and engaging, but to discover the reasons why projects succeed so this knowledge can also be embedded into future project routines.

***Recommendation 3: Reflect over the course of the project rather than just at the end.***

Performing lessons learned sessions upon project completion is a useful way to uncover learning from the project overall. However, project teams may not have recorded learning as the project progressed. For projects that last for months or years, project members will clearly have difficulties surfacing memories about the ways in which they solved problems over the course of the project, making the learning generated in lessons learned sessions highly selective and potentially less than useful for future teams. It is recommended that PMO Leaders actively promote formal reflective processes

throughout the course of projects. This can be accomplished in a variety of ways at a variety of levels. For example, project members may be encouraged to maintain a personal journal to capture their thoughts and emotions along the way. Further, project status meetings can be improved by including updates not just on milestones and deliverables, but also on the processes the team used or did not use to get those results.

***Recommendation 4: Provide useful process knowledge to project teams by asking “why” questions in lessons learned sessions and embedding stories and examples from past project experiences into standard methodologies and templates.***

Most lessons learned practices focus on “what worked and what didn’t” with respect to past project activities. It is recommended that these reflective questions be supplemented with the question “why” something worked or why it did not. This may generate more useful knowledge for not only the project team reflecting on the experiences, but for prospective project teams who need to heed this advice on future projects. Asking “why” can evoke richer, contextual information about why the practice worked or did not so future project teams can make informed choices about their planned approaches. This richer, contextual information may also be accompanied by what was formerly tacit knowledge on the part of the originating project team, making this knowledge more accessible to the organization.

***Recommendation 5: Establish conditions more conducive to productive reflection in lessons learned sessions by utilizing a skilled facilitator and focusing on processes rather than people.***

Lessons learned sessions can be dominated by defensive routines which can distort the reflective process and block learning at the project level. The “lessons” that result may therefore not represent the true experiences of project teams, further undermining the organization’s ability to continuously improve. It is recommended that knowledge management leaders provide a means for project teams to utilize a trained facilitator from outside the project team who can help the team uncover its tacit knowledge and provide conditions that foster equal participation so organizational members’ defensive routines do not dominate the session. A skilled facilitator from outside the team can help the group avoid “blame-storming” and focus on the processes by which they achieved their outcomes rather than focusing on the performance of specific individuals, thus creating an atmosphere less conducive to defensiveness, blame or individual heroics.

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## DISCRETIONARY EFFORT: “CAN WE REALLY ACCOUNT FOR PERFORMANCE SURGE?”

By Kurt April and Victor Katoma © 2008

**Abstract:** When variables are measured on the same set of individuals, the statistics detailing the degree of association between them are vital for inference. Such statistics help to reveal the causal effects and conceptual structures among the underlying variables and can be used as instruments for developing and validating conceptual models. We seek to demonstrate that, by carefully constructing work –effort-related hypothetical structures through statistical measures, a Discretionary Effort model can be realized and fitted. Using empirical data from a survey in professional networks, we tested two models emerging from different sets of expectance variable combinations, with a sample of 1548 primarily managers from various sectors.

The first model was based on valence, instrumentality, and expectance (VIE), whereas the second included these three variables and self-affirmation (VIEA). Analysis of construct validities revealed that VIEAs were better fitted than VIE. Structural measures using covariates were able to explain that VIEA is an improved version of VIE.

**Keywords;** covariance, latent, expectance, discretionary, professional networks.

### Introduction

Discretionary effort (DE) is an appended actionable force that manifests itself only under the right circumstances. DE is thus highly anthropocentric, virtually latent, and not easily exercised in the workplace. Although, many business attempts have been made to heighten the importance and the need to gauge DE with reference to changing organizational competitive needs, very little practical work has surfaced (Morrison, 1994). Yet, the challenges of sustaining and growing businesses are becoming bigger and more complex. When employers start to ask, genuinely, for more and more effort than is designated by job description, employees should know it is time to explore their own untapped potential. Nor should it be surprising to the employees when employers attempt to estimate the degree to which workers create

value for the organization that exceeds mere reciprocity.

It appears obvious that, in a dynamic economy, performance measures alone are turning out to be inadequate (Kath, 1964) to account for the intended workforce value-creating capacity (Aldag & Reschke, 1997). Even where these traditional performance measures have been judiciously applied, there is inherent room for discrepancy, largely because business influencer factors such as technological innovations, and now the highly tactical business processes including business intelligent agents (Levitt, & Jin, 1998) and the rapid shift to a service-oriented economy have had polarizing effects on such metrics (Ray, 1997). Business leaders can attest to the fact that it is no longer the systems or external forces or conditions that matter the most, but latent components of human assets’ becoming central to organizational competitiveness

and ultimate business survival (Lee, Miller, 1999) (Barnard, 1938, Katz, 1964, Katz & Kahn, 1978) (Berman & Katoma, 2006).

Moreover, in an economy that has become highly knowledge intensive, technologically sophisticated, and increasingly reliant upon manager leadership style, it is essential to begin focusing on measuring the surge in performance. Unlike the managerial approach, which is often limited to managing systems and processes, the leadership approach demands that people not be managed, but be led; thus, the inherent difficulty of accounting for every performance measure can be reduced by accounting for the surge in performance. Besides, in organizations where conversional measures have been repeatedly used and even benchmarked, the systematic approach to DE can enhance such measures. One critical benefit of this continuum is the provision and alignment of methodologies and careful definition of lower and upper bounds as delimiters. By attaining these measurement levels, specific elevated performance value domains can then be targeted.

Although, it seems that there is a need to generate new theories, failure to first apply the current theories is derailing sound scientific advancement in this area (Haire, 1954). What is critical here is to first establish DE variables and methodologies in the corporate repository and quickly convert the theory from storage and representation into paradigm development and then into practice.

Hence, we first introduce the conceptual level of work behaviors and then discuss modeling strategies necessary for investigating behavior constructs of DE. We then propose a rigorous approach to defining and treating DE variables. This process is

essential because DE variables, like other latent variables, require modeling to explicate the information they contain. Second, we illustrate how data classification is vital for DE variable selection. We then discuss a conceptual model of DE and finally demonstrate two different aspects of DE emerging from different variable combinations as a way of investigating the following hypotheses:

***Hypothesis 1:*** The expectancy model (VIE) fits well in a professional network when self-affirmation (A) is included as one of the core components with valence, expectance, and instrumentality.

***Hypothesis 2:*** Employees (personal level) have stronger DE views than those they perceive the organization (organizational level) to have.

### Conceptual Model

Hypothetical constructs are often criticized for placing too much emphasis on the claim that they correspond to real-world events (Togerson 1958, Goldberger 1972) (Durham, 1975). On the contrary, it is hard to convey any meaningful information, certain knowledge, and theoretical laws without hypothetical structures (Gross, 1968) (Cronbach, 1955). Nor does there seem to be a more profound process of illuminating and providing insight from isolated theories than by developing hypothetical structures that are subsequently indirectly measured with latent variables (Gay, 1996). We believe that controversy over the use of hypothetical constructs emerges when complex phenomena are given naïve attention, for example, by carrying out research designs that are limited to non-progressive research boundaries and scope. Such practices have tended to confine well-intended facts of theory to misguided

principles that have been obscurely used and thus blocked the path to understanding. Research that is primed to address complex hypothetical constructs must make its aims and methods readily understood. This antecedent highlights also the concern that research that is framed on psychological premises, such as self-esteem, personality, life-satisfaction, expectance, and self-affirmation, be given an epistemological status (Messik, 1981). Thus, rather than limiting findings to a set of constrained theory and hypothesis, a dynamic and process-oriented research approach can enrich and embolden scientific advancement in DE, at the same time seeking to maximize meaning and optimize measurement (Peterson et al., 1982).

### Discretionary and Covariance Structures

We began by positioning DE as a latent variable that is caused by other latent variables, namely, expectancy, instrumentality, self-affirmation, and valence, which were measured by manifest variables from the survey instrument.

In mathematical terms, the relationship between the latent construct and the observed indicators is normally modeled with a common factor model (Spearman, 1904):

$Y_{ij} = \mu_i + \lambda_{ij} X_j + \epsilon_{ij}$  so that  $X_i$  is the latent variable or common factor (in this case the aforementioned DE) representing the hypothetical construct,  $\lambda_{ij}$  the factor loading for  $i$ , and  $\epsilon_{ij}$  a unique factor representing specific aspects of item  $i$  and measurement error. On the other hand, specific latent variables listed as expectance, instrumentality, valence, and self-affirmation would represent the true scores of continuous variables measured with error.

For continuous items or measures  $y_j$  for unit  $j$ , the measurement model from classical theory (Lord & Novick, 1968) can be written as  $y_j = x_j + \epsilon_j$ , where  $x_j$  is the true score and  $\epsilon_j$  is the measurement error. The measurement errors have zero means and are uncorrelated with each other and the true scores. In fact, the true score is defined as the expected value of the measurement variable or item for a subject  $x_j = E(y_j)$ , over imagined replications (Lord & Novick, 1968).

### Modeling Fundamentals

At this juncture, we acknowledge, in line with Skinner's assertion (1953, p.35), that human behavior variables are derived from a complex mixture of theories and behavior systems. In psychology they are best understood when associated with special measurements and mappings, evident in such endeavours as performance measures. Bentler (1978) and Bagozzi (1980) argue that complex structures and construct validities should necessarily be investigated by means of structural equation modeling. In modeling processes, variable measurements and causal determination are further perceived as based on information contained in the variables and on how variables interact and are related. It has to be noted that, although we discuss modeling with measure on manifest and latent variables, measurability is better defined when variables are discussed as information about events in the context of set fields. We introduce sets of fields as a family of sets closed under complementation and finite unions. A measurable space is a pair of sets  $S$  and  $\Sigma$ , expressed as  $(S, \Sigma, \mu)$ , where  $S$  is a set and  $\Sigma$  a sigma field on  $S$  (Kolmogorov, Fomin, S.V, 1975). The elements of  $\Sigma$  are called measurable sets and  $\mu$  a measure. More important, if  $\mathcal{A}$  is a family of a set  $S$ , then  $\mu(\mathcal{A})$  is a field algebra generated by  $\mathcal{A}$ ,

that is, the smallest field algebra  $\sigma(S)$  on  $S$  which contains  $\hat{A}$ . Roughly speaking,  $\mu(\hat{A})$  is the class of all events that can be decided given that we know the status of the events in  $\hat{A}$ . Thus, when  $X_i$  and  $Y_i$  variables are first treated appropriately as sigma sets and defined as manifest and latent variables, entry into measure space is almost obvious. This is a strategy aimed at underpinning facts and information in a way that best facilitates explication of results and pulls results together into a cohesive yet statistically supported anecdote (Dubin, 1969). Our focus is most importantly aimed at establishing objects that can be codified without loss of generality.

### **Storage and Structuring**

A concrete corporate memory is vital to business processes and instrumental to any significant shifts in business strategies and innovation. Codified data are not only easy to access but crucial for inference, especially data that is based on history on which Bayesian methods can be used. We propose that corporate memory must therefore include segments with well-defined DE objects, variables, and experimental data. With such structures and data, business would learn the procedure of determining DE or at least begin to be more pragmatic about the philosophy behind DE, rather than merely urging employees to do more than what is proportionally allotted to them. The other purpose here is to empirically demonstrate where we stand in providing principles and generalization of the theory in discourse. Although, it would be naïve to point to some sort of DE benchmark at this moment, it is fairly reasonable to assert that these are among the achievements companies will eventually seek.

Much of the investigation in this paper is based on the premise that DE is derived

from expectations placed on the outcome of an action (Leonard, 1995). It is also guided by the assumption that DE depends on the variance of the outcome and its instrumentality, that is, if a person took a particular action, a certain outcome would follow (Scholl, 2002) (Vroom, 1964). Even though this supposition forms the central theme of much of the existing framework about DE, different perspectives abound. This is simply because emerging business processes tend to be inclusive and encompass a large set of influencer factors such as trust, perceived leadership support, and continuance commitment, all critical in professional networks. April (2006) posited, for instance, that DE is also highly dependent on self-affirmation. We recall also that, when Vrooms (1964) first postulated the likely interrelationship among the aforementioned DE variables as VIE, different researchers attempted to produce DEs with different variable combinations. However, most of the results measured job satisfaction more than they measured DE, which nonetheless paved the way for further investigation and refinement of the measurement instruments and criteria. From these positions, construct validities have shown that, indeed, DE models are not only obtainable but also scalable.

### **Segmentation and Variable Groupings**

Expectancy theory tends to be motivational in nature, in part, due to the grounding work reflected in VRoom's (1964) work on VIE, which we do not question here, but build upon. Motivation itself is a wide and complex concept in the psychology of human behavior. Without dwelling much on the subject of behavior, our stand is, however, that DE draws from motivational and non-motivational groups and classes of variables. Corporate memory should

therefore be designed with DE constituents containing classes of these human behavior sets of variables. A great deal of effort should therefore be focused first on variable definitions and storage and second on variable classification, paradigm development, and then practice. Storage in this view is defined as the physical and logical representation of concepts, but with clear semantics attached to their hierarchical and ontological orientation. For instance, the VIE group is composed of three sets defined categorically as valence, instrumentality, and expectancy. Each of these sets has elements such as skill base, aspiration levels, and work reward options. Remember that, while there has been a race to convert hypothesis or at least codify knowledge in many aspects of research including complex phenomena such as knowledge management processes, little, if any, information points to DE systems. The question then arises: what is the use of theory if it cannot readily translate into practice.

For business entities, it is in fact the usage part that is most sought. Although synergy may occur between concept and usage when the paradigm feeds directly into usage, it is unlikely that pieces of concepts alone will be adequate and accurately used for most of the intended purposes. Thus, isolated concepts and visual portrayal alone of the underlying causal relationships among DE variables may not be enough without systematic storage and clear hypothetical and tested constructs of DE models.

### **Classification**

Measurement models are usually specified with continuous latent variables, for instance  $X_j$ . Such models are called factor models when the observed variables are continuous and otherwise noted as item response models when the measures are categorical

(Skrondal & Rabe-Hesketh, 2004). Sometimes the true variable (manifest) is instead construed as categorical, a typical example being medical diagnosis (ill versus not ill). The measurement is, in this case, usually also categorical, with the same number of categories as the true variable. Measurement modeling can thus be used to assess measurement quality, especially in cases where ambiguities can be problematic and when high accuracy levels are required. When the true variable is continuous, measurement quality is typically assessed in terms of the reliability of individual measures (Skrondal & Rabe-Hesketh, 2004). If the true variable is categorical, measurement quality is typically formulated in terms of the misclassification rate, sensitivity, and specificity. The categorization process is very critical in dealing with the variables according to the sets that represent them effectively, in light of their being motivational or non-motivational and nested groups. Whether they are probabilistic or not and Boolean or not are some of the important records required. In business it is common to classify customers into market segments. For example, Magidson & Vermont (2002) used latent class to classify bank customers as value seekers, conservative savers, and investors. In psychology, Prochaska & DiClemente (1983) looked at social classes, revealing stages of change in patient behavior such as trying to quit smoking. In sociology, one would investigate the social classes of particular types of people.

In total, we derived four classes from VIE and VIEA, two from VIE and two from VIEA. Classification was based on the individual and work perspectives of expectancy, valence, and instrumentality and within the affirmation variables. The measurement instrument was further subdivided into two parts. the first ten

questions focusing on expectancy variables and the remaining eight questions focusing on expectancy constructs, as illustrated later in the factor class analyses.

### Value Domain

Latent variables are synonymous with business objects. They possess attributes as secondary objects or manifest variables. Storage of discretionary variables therefore should be defined around business data objects, purposed to capture outer and measurable elements in order to induce measurement of the inner latent variables. The main objects in the data model of a corporate memory database could be the *source* (from which the discretionary variable emanated, typically a human or a published work), the *snippet* (for instance, a posting or message, usually one fact or idea about discretionary constructs), and the *file* (representing either the creator's own work or a reference s/he found concerning the viability of the expectance construct). Each of these objects can be specialized, depending on how the discretionary framework is realized in a particular system and environment. For example, an implementation of the framework may distinguish snippets posted as motivational and non-motivational variables and items related to valence and instrumentality.

Each of the three main types of object or latent variables, for instance, expectancy,

instrumentality, and valence, can be associated with secondary objects that add value to that object – *ratings* given by respondents on the measurement instrument, *comments* made by readers, and system *metadata* collected such as the individuals' perception of the meaning, which class category it is likely to fall into, and who entered it into the system and the date on which this was done. These secondary objects all are useful in computing manifest variable scores. Recent research at Shell International (Hendrix, 2007) revealed that, in a professional network where employees are explicitly seen to exercise their DE through sharing and helping others, several variables need to be considered. The most apparent drivers of DE in that platform included perceived leadership support (at the organization level), sense of community, and perceived usefulness of the system.

Objects in the model are associated with each other via directional links. Any secondary object can be related to any source of effector variables and can reference any other object in the model. Every object has an individual concept associated with it and specific constraints and definitions of how that object can be used. The descriptions of the operations on the variables and value ratings are consistent with the basic metadata registry model for data semantics, as illustrated below:

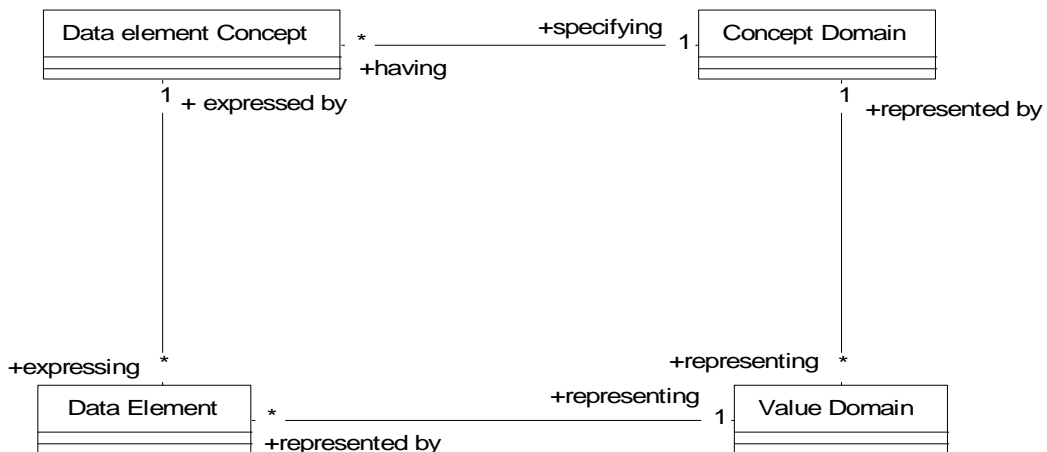


Figure 1. Overview of the metadata registry (ISO03)

The diagram above has two levels, namely, the conceptual level and the syntactical level. Conceptual level constitutes the “data element concept” and the “concept domain” classes, while the syntactical level is composed of “data element” and “value domain.” Data elements such as ratings in the data model are represented by manifest variables;  $x_1, x_2, x_3, \dots, x_n$  and are defined

by the data element concept. The data element concept describes the data type (ISO95), for example, real numbers. The value domain assigns the data elements with permissible values, for instance, the value 1 as true and 0 as false or 0 and 1 for negative and positive values, respectively. Expectancy that, for example, spans a range of 0 and 1 is purely probabilistic.

Table 1: Value domains

Class description	General description
<p><b>I. Conceptual Domain</b> A set of value meanings, for example, probability values.</p>	<p>Value domains are not necessarily related to any data element. Two value domains that share all the value meanings are conceptually equivalent and share the same conceptual domain.</p>
<p><b>II. Value Domain</b> The set of designations for the classes of a partition determined by a characteristic. A designation is known as a value, the associated class of the partition is described by a concept called the value meaning, and each value and the associated value meaning pair is known as a permissible value (ISO04).</p>	<p>Two value domains that share some value meanings are conceptually related and share the same conceptual domain in a concept system containing each of the conceptual domains.</p>
<p><b>III. Data Element</b> The containers of data. The term data element is synonymous with the term variable or manifest, as it is understood in programming. Thus, the data type associated with a data element is important.</p>	<p>Many data elements may have the same value domain. For example, the expectance value would be either 1 for high or 0 for low. Expectancy can be expressed as a probability between 0 and 1.</p>
<p><b>4. Data element concept</b> Would define, for instance, real numbers.</p>	<p>A data element concept is related to a single conceptual domain, so all the data elements sharing the same data element concept share conceptually related representation.</p>

An example: A population consisting of objects about the observed data can be given as  $x_1, x_2, \dots, x_n$ , and the framework for

understanding the data would be as illustrated in the diagram below:

Table 2: Example 1

Population	Set of range of expectancy outcomes
Characteristic	Proportion of valence variables
Partition	$\{x   0 \leq x < 1\}$
Designation	Real numbers between 0 and 1

Table 3: Example 2

Population	Set of motivational items
Characteristic	Proportion of expectancy variables
Partition	{effort-performance expectancy,..., leading-visibility expectancy}
Designation	EP, IP, EL, LV, NP, IR, MR, NL, PO, TS

Table 4: Example 3

Conceptual domain name	Probabilities or knowledge item categories
Value Domain	All real numbers between and including 0 and 1
Permissible values	< 1, Maximum Positive Outcome> < 0, Minimum Positive Outcome>
Data element	Set of items (variables) on the measurement instrument
Data element concept	Real values

Part of the reason for describing data in a metadata registry is to establish some form of description of a data construct or instances so that operations estimations are maintained in a uniform and prescribed manner. For instance, variable identifiers, quality measures, responsible organizations, and definitions are recorded for every data construct. It is also crucial that in a process with in-depth coverage of concepts from different areas of study, such as human physiology and mathematical modeling, a thorough definition of variables is sought for consistency. This precept is in line with Argyris and Schon (1974), who posited that people use mental mind maps in making decisions and how they actually arrive at those decisions. Even though psychologically based studies often take heuristic stances, increased practical experience and improved measurement tools are providing more ground for strong claims and conclusions. We expect that greater

realistic outcomes will be unveiled, for example, in how individuals treat DE issues.

### Factor Analysis Scoring Processes

We envisioned that data should be subjected to scoring and classification processes so as to refine our measurement instrument and at the same time pave the way for a more inclusive and learning cycle. We realized early that a modeling process that provided an epistemological status to hypothetical structure constructs could be better positioned and form a good basis for measuring the performance surge values. Value as seen by many business architects is elastic, that is, it embodies large sets of business components, including customer value and an avalanche of the often esoteric variables tied to the service economy continuum.

For the first part of the measurement instrument, variables focused on expectancy items. Factor analyses identified two components (table 4) critical to expectancy measurements. Factor one (EP) defines IP, EL, LV, NL, and PO. Factor two (MR) accounts for NP and IR. TS scored moderately on both factors and thus bridged the two. Expectancy is what employees come to expect in joining a particular network. It is about the process of making certain choices based on certain desires of the individual and those perceived on the part of the workplace. The instrument was therefore framed to reflect views of both the individual and the workplace based on a five-point Likert scale: 1. Effort-performance expectancy (EP). 2. Interpersonal-performance expectancy (IP). 3. Effort-learning expectancy (EL). 4. Leading-visibility expectancy (LV). 5. Network-performance expectancy (NP). 6. Mutual-reciprocity expectancy (MR). 7. Individual-network learning expectancy (NL). 8. Performance-outcome expectancy (PO). 9. Team-sustainability expectancy (TS). The Cronbach's alpha reliability on the items was 0.77 at the individual level and 0.84 at the workplace level. In both cases, the mean difference values were significantly less than 0.05, indicating that there was a high dependence between the variables in each group.

The second part of the measurement looked at specific questions regarding mostly motivational tools and constructs highly varied as instrumental in affecting the way employees were likely to exercise DE, ranging from effort expectancy constructs to team sustainability constructs. The variables are listed as follows: (1). Effort-expectancy constructs (EE) with reliability test of 0.65 for personal and 0.82 for work measures. (2). Performance expectancy constructs (PE) registering a reliability of 0.61 and 0.83 for personal and work ratings, respectively. (3). Achievement of workplace goals (WG) with a personal reliability measure of 0.74 and work reliability measure of 0.85. (4). Emotional orientation for desired outcome (EO) scoring 0.59 and 0.82 for reliability on personal and work measures, respectively. (5). Positive comparison of expectancy with peers (PC) with 0.70 for personal reliability and 0.63 as work reliability score. (6). Self is seen to have capacity for efficacious action (EA) registering 0.63 for personal reliability and 0.80 for work. (7). Team-sustainability expectancy (TS) also scoring higher than the recommended average of 0.70 on both sides. The mean differences were very small in all the group items, far less than 0.05, showing a close dependence in the variables as we anticipated.

Table 4: Rotated expectance factor results

	Component Personal Expectancy		Component Work Expectancy
	1	2	1
EP	.660	.072	.632
IP	.548	.206	.640
EL	.636	.209	.681
LV	.573	.059	.574
NP	.164	.707	.618
IR	.200	.643	.588
MR	.099	.762	.633
NL	.648	.216	.704
PO	.615	.245	.701
TS	.429	.454	.647

The scoring revealed that the first ten variables are better defined as effort-performance and mutual-reciprocity factors but interlinked by team-sustainability variable. Effort-performance is a belief that, towards an individual expended effort, an effective performance outcome is expected. Mutual reciprocity is a give-receive balance employees expect in the work environment. Whatever they give in work, they expect to receive in reward; which is in line with causal performance measures that are based on operation and includes process cost, time, and quantity and quality factors. TS, is the team sustainability component, which serves well as a moderating factor between EP and MR. Whatever the effort and its outcome may be, the team as a whole has to be strengthened for continuity's sake. When factor analysis was conducted, focusing on the work perspective side, only one component emerged as representative of the rest of the variables, namely, the individual-network learning expectancy (NL). While

individuals are more likely to derive their DE expectancies from EP and MR, organizations, according to this finding, viewed DE mostly as instituted by network learning (NL) experiences that employees are perceived to acquire through professional networks.

Factor analysis directed at the second class of the questionnaire was proposed to investigate whether employees were frequently provided with what they needed to exercise DE. The two Likert scales were thus defined according to how frequently the tools were provided at the individual level and whether the employee's functions were measured and the level of importance the function had in the work place. Results in the table below illustrate that, at the individual level, six components emerged. First, all the initially defined factors were accounted for without much loss of information.

Table 5. Rotated Factor Analysis Results

	Components: Personal Level						Components: Work Level			
	1	2	3	4	5	6	1	2	3	
EE1	.567	.135	.110	.116	.238	-.133	EE1	.300	.158	.684
EE2	.597	.026	.155	.006	.146	.175	EE2	.246	.202	.780
EE3	.253	.307	.075	-.026	.570	-.069	EE3	.176	.345	.657
EE4	.327	.289	.394	.073	.121	-.242	EE4	.296	.356	.545
EE5	.650	.055	.075	.109	.069	.118	EE5	.523	.044	.389
PE1	.536	.180	.116	-.059	.304	.247	PE1	.342	.316	.595
PE2	-.026	.035	.424	.036	.426	.067	PE2	.226	.289	.685
PE3	.349	-.036	.056	.124	.589	.089	PE3	.407	.248	.549
PE4	.593	.109	.144	.264	.086	.044	PE4	.596	.152	.424
PE5	.493	.300	.087	.300	-.020	.001	PE5	.602	.144	.341
WG1	.220	.670	.053	.016	.132	-.066	WG1	.375	.398	.442
WG2	.244	.386	.506	.084	-.213	.074	WG2	.475	.399	.317
WG3	.379	.197	.522	.137	.048	-.090	WG3	.675	.214	.282
WG4	.456	.247	.398	.092	.078	-.088	WG4	.686	.263	.270
WG5	.434	.466	.239	.188	-.050	-.037	WG5	.657	.316	.203
EO1	.319	.020	.539	.103	.074	.239	EO1	.421	.420	.350
EO2	.255	.246	.507	.151	.111	.146	EO2	.440	.494	.325
EO3	-.037	.011	.602	.127	.162	.053	EO3	.193	.575	.180
EO4	-.008	-.037	.232	.233	.435	.387	EO4	.433	.490	.234
EO5	.301	.013	.054	.424	.408	.050	EO5	.462	.474	.300
PC1	.385	.311	.162	.330	.152	-.022	PC1	.470	.497	.278
PC2	.133	.049	.132	.735	.107	-.074	PC2	.503	.428	.257
PC3	.348	.125	.154	.384	-.240	.395	PC3	.521	.402	.173
PC4	.070	.366	.195	.570	.129	.050	PC4	.367	.587	.171
PC5	.374	.161	.382	.443	-.166	.130	PC5	.463	.277	.102
EA1	.040	.174	.092	-.032	.112	.614	EA1	.078	.625	.287
EA2	.141	.494	.211	.208	.233	.146	EA2	.333	.641	.255
EA3	-.069	.683	.100	.050	-.072	.193	EA3	.051	.732	.138
EA4	.366	.438	-.055	-.066	-.010	.481	EA4	.254	.507	.203
EA5	.139	.646	.104	.166	.046	.166	EA5	.348	.615	.207

The classes of sigma algebras ( $\sigma$ ) from the table above can be written as  $\sigma_1$ . **{EE(.65 commonality) {EE1,EE2, EE5, PE1, PE4,PE5, PC5, PC1, EE4, WG4, WG5, EA4}}**,  $\sigma_2$ . **EA(.68 commonality) {WG1, EA2, EA3, EA5, WG5, PC1, EA4, EE4}}**,  $\sigma_3$ . **EO(.60 commonality) {WG2, WG3, EO1, EO2, EO3, PC5, EE4, PE2, WG4}}**,  $\sigma_4$ . **PC(.74 commonality) {PC2, PC4, EO5, PC5, PC1}**.  $\sigma_5$ . **PE(.59 commonality) {EE3, PE3, PE2, EO4,EO5}** and  $\sigma_6$ .

**EA(.61 commonality) {EA1, EA4, PC3, EO4}}**

It must be noted that the six components are represented by the first two letters preceding each set. The components thus can be clearly denoted as EE, EA, WG, EO, PC, PE, and EA, comprising different variables each arising from the different factors. Board letters illustrate variables with higher influence that are not shared by other sets. Simple trend can be seen, showing that the

EE and PE are grouped in one category as factor 1. EA dominates factor 2, while factor 3 is influenced by WG and EO. Factor 4 is moderately represented by PC, and the rest, namely, factors 5 and 6, are weakly represented by PE and EA. This is because PE and EA are well represented in other factors in a more homogeneous manner. Vetting these variables strictly leaves us with 4 factors determined by EE, EA, EO, and PC.

At the work level, however, only three components were evident, namely; **EE**, **EA**, and **WG**. The first two components **EE** and **EA** were consistent with those extracted at the personal level or individual components but it can be clearly seen that WG was in fact representative of EO and PC. Generally, the factors were not very significantly different but were fewer than the previous class. One important conclusion is that, from the first group, the factors reduced to half when compared at both individual and work levels. The same trend was apparent for the second group according to the results from the two classes. In the second survey, we will either restructure or rearrange the questions whose measures have been identified to have fallen in unexpected factors. Alternatively, it would be easier to establish a functional measure that would transform such variables in order to have a

refined instrument. This is, however, left for future work.

What is of interest, again, is the EP, MR, and TS variables identified earlier, as they seem to significantly influence expectancies. Another important result is that, as revealed by the sets above, EE and PE are the determinants of instrumentality and fall in the same sigma algebra set  $\sigma_1$ . WG and EO are the main influencers of valence and belong to one sigma algebra  $\sigma_3$ . Self-affirmation is determined by PC and EA.

### **Modeling with Classes**

The modeling process was conducted with Lisrel Software. The main aim was to test whether and how VIE and VIEA models would fit our data and inductively validate the measurement instrument, at the same time making the case that the hypothetical constructs on DE are worthwhile exploring. Tables 1 and 2 constitute classes A (VIE) and B (VIEA) forming group 1 of variables derived from factor analysis. Tables 3 and 4 compose classes C and D, which is group 2, with variables exactly the same as in classes A and B (group 1). Group 1 represents the effect of personal perspective of employees on the measurement instrument, while group 2 expresses the work perspective of the employee or how companies perceived DE.

Table 6: (Class A)

<b>Personal without A (VIE).</b>								
Measurements Equations								
	EP	MR	EE	PE	EO	WG	R <sup>2</sup>	t-statistic
E	0.656						0.112	5.256
E		1.000					0.125	14.465
I			1.000				0.663	9.789
I				0.894			0.581	17.691
V					0.706			
V						1.000	0.541	10.895
Structural Equations								
	E	V						
I	0.452						0.841	0.935
I		0.586						2.494
<i>E</i>		0.462					0.660	6.227

As seen in Table 1, load factors were high, consistent with the factor analysis results that the endogenous variables significantly influence the latent variables. R<sup>2</sup> values were also significant, indicating that the variances in relationship between the manifest and latent variables were largely accounted for. The least accounted for variances occurred between EP and E (0.112) and between MR and E (0.125). The t-statistics were highly significant, greater than the recommended 1.96 except for the causal relationship between E and I (0.935),

as shown in the structural equation part of the table.

For the models to be considered adequate as fitting the sample data, goodness of fit indices (GFI) were used. From class A, the degree of freedom (df) was 6 and chi-square was 13 ( $p = 0.0333$ ). The root mean square (RMSEA) was 0.0431, less than 0.05, a very good achievement. The goodness of fit index was 0.993, and the normed fit index (NFI) was 0.990. These are significantly adequate and acceptable results.

Table 7: (Class B)

<b>Measurement Equations with A (VIEA)</b>										
	EP	MR	EE	PE	EA	PC	EO	WG	R <sup>2</sup>	t-statistics
E	0.627								0.111	3.478
E		1.000							0.135	9.243
I			1.000						0.655	7.143
I				0.906					0.594	12.477
A					0.656				0.315	8.368
A						1.000			0.733	3.782
V							0.739		0.391	9.945
V								1.000	0.505	8.656
Structural Equations										
	V	I	E	A						
V	0.258 (0.042)									

	6.176			
I	0.212 (0.025)	0.210 (0.028)		
	8.317	7.600		
E	0.129 (0.031)	0.117 (0.026)	0.096 (0.052)	
	4.181	4.465	1.827	
A	0.293 (0.033)	0.221 (0.026)	0.112 (0.030)	0.352 (0.052)
	8.915	8.614	3.684	7.076

In Class B, the R<sup>2</sup> values are significantly high, except for the relationships between EP and E, (0.111) as well as between MR and E (0.135). The t-statistics in this class are all highly significant, illustrating that all the relations between the variables in this class are strong and important. The load factors are very significant considering that there are more variables measured in Class B than in Class A. The t-statistics measuring the effects among the latent variables are all highly significant shifts from class A, consistent with fundamental regression analysis claims that the more variables at play the better the representation of the causal structures, as more information is elicited.

It can be deduced that the affirmation aspect (Class B) reveals more causality among the underlying variables. The variable self affirmation (A) is therefore a justifiable influencer on DE, with t-statistics of 8.368 and 3.782 on the measurement equation and t-statistics of 8.915, 8.614 and 3.684 in the structural equation.

Class B had 13 degrees of freedom and a chi-square of 7 (p = 0.878). The Root Mean Square was 0.0, with both GFI and NFI at 0.994 as well. There was a slight improvement in all these measurements compared with the results of Class A, showing that the model fit in the same group was very close.

Table 8: (Class C)

<b>Work without A (VIE).</b>								
Measurements Equations								
	EP	MR	EE	PE	WG	EO	R <sup>2</sup>	t-statistic
E	0.832						0.258	7.140
E		1.000	0.691				0.261	13.198
I			0.445					3.353
I				1.000			0.841	6.003
V					1.017		0.763	28.230
V						1.000	0.727	12.933
Structural Equations								
	E	V					R <sup>2</sup>	t-statistics
I	-0.0064 (0.109)	0.983 (0.0556)					0.875	17.683
	-0.059	17.683						

I	0.356 (0.0434)	0.371	8.203
<hr/>			
<i>E</i>	8.203		

Class C and Class D look at the work perspective of the DE. In the table above, it can be easily observed that the loader factors are significantly high, with the least measurement of 0.445 between EE and I on the measurement questions of table 8. The R<sup>2</sup> reveals that more information was accounted for in the relationships between the variables when compared with both classes A and B. The t-statistics were also consistently high on both the measurement

equation and the structural equations. This result also indicates that group 2 was more consistent than group 1, both in relations between the variables and further revealing the internal consistency of the work aspect of items on the measurement instrument.

In Class C, the df was 5 and chi-square was 3 (p = 0.618). RMSEA was 0.0 and GFI was 0.998, with NFI at 0.999. These are more accurate results that those for Classes A and B.

Table 9: (Class D)

<b>Work with A (VIEA)</b>										
Measurement Equations with A (VIEA)										
	EP	MR	EE	PE	WG	EO	PC	EA	R <sup>2</sup>	t-statistics
E	0.86								0.259	7.128
E		1.000							0.244	13.687
I			0.699						0.712	11.871
E			0.475						-----	3.353
I				1.000					0.824	6.894
V					0.982				0.741	30.238
V						1.000			0.749	13.752
A							1.000		0.705	12.933
A								0.843	0.671	25.398
Structural Equations										
	V	I	E	A					R <sup>2</sup>	t-statistics
V	-----	-----	-----	-----						
I	2.079 (0.109)	-----	0.031 (0.967)	-1.060 (0.057)					0.941	2.145
	0.288		2.145	-1.196						
E	0.336 (0.0413)	-----	-----	-----					0.364	8.133
	8.133									
<i>A</i>	-----	-----	-----	-----						

Class D in group 2 was by far the best represented in terms of loader factors and index measurements of the amount of variances accounted for and the significance

of those variables as revealed by the t-statistics compared with the other classes.

When classes are ranked according to how well they revealed the causal validity of DE, class D is ranked first, followed by Class C, then B, and lastly A. Construct validity as illustrated in groups 1 and 2 shows a trend in factor loading between groups. Classification, as well as categorization, of data is therefore highly visible and necessary in this result and also an important result in DE research. This finding is important because DE is a continuum based on the emergence and convergence of different variables often stemming from motivation in human psychology and other non-motivational variables that are equally vital. VIEAs are not only more accurate than VIEs between classes, they are also distinct within groups.

For Class D, the df was 14 while the chi-square was 26 ( $p = 0.0240$ ). The p-value was the lowest of all the classes. RMSEA was at 0.0358, GFI of 0.991, and NFI at 0.995. These are optimal results and highly acceptable. Although other indices suggested that D is slightly less optimal than other classes, the scores are in all the counts higher than the recommended values and the results on the validity in Table 4 reflect that, indeed, Class D is the best-represented class. One interesting finding on Class D is that self-affirmation was not as significant as it was measured on the rest of the classes.

### Conclusion

We have described in a general sense the process-oriented approach to defining and treating DE variables. We believe that, when these variables are systematically positioned in any work environment and clearly understood, quick paradigm and system development will naturally follow. We have also demonstrated that the processes of factor analysis and variable classification play an important role, in selection of

relevant DE variables, especially in the face of overwhelming theory of ambiguous meaning.

Factor analysis revealed the most critical components of the items in the measurement of DE, while the classification exercise categorized these components into classes for easy comparison and explication of information in the models. We also noted that items which did not score well can be improved upon, a subject reserved for future work.

The modeling process showed that, indeed, DEs are well represented by the current theoretical constructs and are scalable. Therefore, we suggest that the DE measurements based on the variable combinations as proposed by Vroom (1964), VIE and the current suggestion of VIEA, are acceptable. Moreover, our data reveal that VIEA is an improved version of VIE. In the future, we intend to include more variables, based primarily on organization citizenship concepts and others from the work with Shell International, as discussed earlier. This precursor is important because the more variables in the model, the better the estimations and the more information and knowledge that can be explained.

In relation to our hypotheses, the results revealed that VIE in professional networks fits well when self-affirmation is included as one of the core components of the model. At the work level, however, self-affirmation was not reflected in the final class D, probably because the organization did not perceive self-affirmation to be accurately measured as it relates to individuals.

Contrary to our assumption that employees have stronger DE views than does the organization, the results revealed that it was actually the organization that had stronger

DE views, perhaps because of the awareness of the need for DE by organizational management. Yet, we believe that DE should be more actively cultivated at the individual level in order to balance the progressive efforts of both employees and organizations.

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## COLLABORATIVE KNOWLEDGE FOR CAPABILITY BUILDING

by Hubert Saint-Onge © 2008

**Abstract:** In spite of all the fanfare, knowledge management initiatives has had very limited success in most enterprises. Most efforts to leverage knowledge in organizations have either failed or fizzled out because for the most part, current approaches view knowledge as a finite resource captured in containers and then made available through repositories. In this paper, we outline a new paradigm in which knowledge is understood as an infinite resource, generated and harnessed through effective collaboration both inside and outside organizations. It's important to bear in mind that knowledge and information are different. Knowledge is information that has been validated by the user, integrated into his/her practice and applied with confidence. Knowledge is best defined as the ability to take effective action. This definition applies as well to organizational capability as it does to individual capability. Collaboration is the conduit through which knowledge exchange takes place and serves to accelerate capability development. As the exchange of knowledge occurs between individuals or teams, it leads to innovation and the generation of new capability. With markets evolving at increasing speed, competitive advantage comes from building capability faster than others. Although few organizations have the whole package, a number of firms have had enough success to create a road map for leveraging knowledge within the organization and across its boundaries – a combination of strategy, leadership, and effective IT implementation to support collaboration and knowledge exchange.

**Key Words:** Collaboration, innovation, capability building, knowledge networks, information technology, strategy.

### Introduction

Technology is necessary for knowledge exchange but entirely insufficient. Businesses that have fallen for the 'mirage' of technology and thought that it alone could engender benefits ended up in a expensive walk through the desert. Real collaboration is hard work. Businesses that embrace the development of collaborative networks to exchange knowledge throughout the organization with the right blend of culture, processes and technology will be able to build capability at a pace that will keep them competitive.

With networks connecting everyone in the organization directly to customers and suppliers, the organization constantly synchronizes its business processes to the dynamics of the market place. Shifts in

customer preferences are felt immediately throughout the organization. Issues with products and services are quickly addressed. Opportunities in the market place are immediately recognized and seized. Silos are eliminated.

To create value from these networks, organizations must implement a knowledge strategy tied to the strategic drivers of the organization – a strategy that focuses on the access of content and the exchange of knowledge through collaboration. By doing so, an organization will be able to react to opportunities with greater speed, collaborate with other organizations readily and successfully, renew its coherence with the marketplace and shape the market as an innovative 'first mover'.

This paper explores 6 key propositions:

1. Performance and competitive advantage spring from an organization's agility in developing capabilities to respond to market challenges and opportunities.
2. Knowledge exchange enables effective collaboration and the ability to develop capability at an accelerated pace.
3. Technology must be deployed with a comprehensive socio-technical approach to provide a workbench integrating collaboration and content management.
4. Networks fuelled by knowledge exchange are becoming more and more important to the performance of organizations in the current business context. Supported by collaboration technology, they bring enterprise-wide scale to teamwork and allow the free flow of knowledge and capabilities.
5. Collaborative work spaces can foster networks that leverage capabilities across the enterprise. Collaboration (vs. content) generates the most relevant knowledge because it is derived from the resolution of problems as the work gets done.
6. The effective deployment of a content/collaboration platform requires leadership which is ready to support a longer-term effort and willing to lead on both the vertical and horizontal axes of the organization.

Networks have the potential to profoundly change how companies view themselves. With existing and emerging technologies, organizations will be reaching beyond their corporate walls and building new types of relationships. However, it is less than clear how companies can mobilize the full potential of these networks to realize competitive advantage. This is where the formulation of a comprehensive knowledge

strategy will create important opportunities. The rewards are significant, but this approach is not for business leaders who are faint of heart, lack vision, or those who cannot nurture long-term value propositions to fruition.

### **The Need for Greater Levels of Collaboration**

Many enterprises are working to differentiate themselves and accelerate growth by extending the width of the integrated solutions they offer customers. The ability to perform well and deliver value requires new levels of agility and flexibility than can only be achieved through purposeful collaboration. Collaboration enhances both the ability to provide optimal solutions to customers and the overall value of the offering.

The drive to realize higher levels of customer-centricity is causing organizations to create 'horizontal' segments which cut across the more conventional 'vertical' segments. The prevalent way to approach prospective customers in many organizations is through different channels or business units focused on geographic areas. The need to focus on enterprise-wide market segments independently of geography makes it essential to collaborate in a much more intensive manner than was the case in the past.

This trend has been evident in some sectors such as financial services, for some time. Yet, it is relatively new in others. For instance, a pharmaceutical company asked to produce millions of anthrax vaccines in a matter of weeks had to form a horizontal team that cut across the conventional verticals of R&D, Manufacturing and Marketing. In another instance, a large retailer sought to accelerate growth through

the implementation of customer segments. It formed horizontal teams at all levels that cut across the more conventional verticals of merchandizing and geographic distribution channels. A great number of organizations are going through these significant changes as they seek to accelerate growth.

More often than not these days, organizations have to meet customer needs through value creation networks with multiple partners. Yet, organizations can only partner externally if they can partner internally. The requirement for increased levels of collaboration imposes considerable weight on people if they have not been given the understanding and tools to do so. The most important of these are technology tools that provide the ability to collaborate virtually.

It has not been easy to foster greater collaboration. The difficulties encountered in working across functions or lines of business often seem to outweigh the benefits in organizations where turf protection has been the norm. In this context, effective collaboration is difficult to achieve: the collaborative muscles of the organization just have not been exercised or even seen as important. In most companies, successful collaboration requires the development of new skills, mindsets, organizational processes and capabilities.

The introduction of collaborative processes and technology as well as the clear expression of this strategic intent by the management can provide a tremendous impetus to enhancing the 'collaborative index' of an organization.

### **The Role of Technology in Collaboration**

Today, organizations are often geographically disparate. Fewer and fewer

people work within a function. Most people now work in cross-functional formations configured to support specific businesses. As a result, for instance, most finance people no longer work within the finance function but are deployed to support specific business teams. At the same time, less and less people are willing to move geographically. This relative lack of mobility on the part of highly capable people have resulted in the emergence of geographically disparate organizations where people end up working on team that span a continent or even the world. The combination of these trends has fuelled the need for virtual teams and communities of practice. For example, one of the eight sectors at Northrop Grumman, the Missile System alone has 45 engineering offices spread across the U.S. When a project team is formed, it is very unlikely that any of the members will be in proximity of one another. It goes without saying work that in such context where there is high interdependence, the success of the project teams relies heavily on virtual collaboration.

Of course globalization only intensifies this challenge. For many international organizations, the boundaries between operations in different countries are disappearing, as networking and collaboration technology becomes more readily available.

With the emergence of increasingly effective collaborative technologies, organizations have also been able to extend beyond their corporate walls to build extensive partnerships with other organizations. External networks can be built with suppliers to enhance supply chains, and with consortia to develop new products. Networking technology has also been instrumental in enabling organizations to engage customers in exchanging

knowledge. For instance, as an experiment, Hallmark Cards built and maintained a community of customers who act as an ongoing focus group. They provide feedback to the company on various new cards, designs, and marketing ideas. Considered a huge success, the company has now widened its application.

Another notable form of collaboration is peer-to-peer (P2P) technology. P2P networks can give individuals access to the group's documents anywhere, any place, and any time. They facilitate new forms of collaboration with dispersed teams and also help develop connections beyond organizational boundaries, with customers and suppliers.

With supportive leadership and an appropriate level of trust in an organization, we now have the technology to enable unprecedented levels of collaboration. Organizations able to capitalize on this opportunity will benefit from the ability to leverage the capability of their people to an extent that just was not possible even 5 years ago. It is now possible to scale teamwork to an entirely new level. Collaboration has the potential to transform the way an organization functions, allowing people to work effectively across hierarchical or geographic boundaries. This will no doubt represent a distinct competitive advantage well into the future.

### **The Emergence of Networks in Organizations**

Networks fuelled by ubiquitous computing and exploding bandwidth continue to rapidly change the marketplace. As these networks dramatically reduce the cost of transactions, value chains are built from multiple participants contributing in the specific domain where they are most proficient.

In contrast to the formal hierarchical view of an enterprise, a network view suggests we are all linked together in an intricate web of connections. In fact, these two views refer to two different dimensions of the organizational structure that have always existed. Networks simply connect people across functional, geographic or organizational boundaries in a dynamic fashion.

Evolving in a way that reinforces and complements the hierarchical structure, they are distinct but inter-dependent and accommodate one another to enhance the effectiveness of the organization as a whole. With team members coming from across the organization (and sometimes beyond), teams are constantly configured and reconfigured to meet the changing needs of the organizations and its market place.

Beyond their tremendous impact on efficiency and productivity, networks themselves have the potential of becoming a strategic resource. The challenge will be to harness this potential effectively by embedding the content/collaboration technology in the way the organization functions.

While there was a time when the emphasis was on obtaining knowledge from customers in order to exploit it, networks now make it possible for an organization to co-create knowledge with its customers, forging much stronger bonds as a result. Many firms have already taken advantage of such networks. Caterpillar Inc., for instance, has created an extranet network connecting it to customers and dealers. Together, they conduct joint experimentation of new product solutions, promoting collaboration and learning between the company technicians and experts from other organizations. Turn around time on product design is reduced by

inviting experts to collaborate within exclusive virtual spaces where they can exchange files and applications real-time. Creating these networks is more a matter of strategy, will and capability than a matter of making huge investments.

There are plenty of signs that these networks and the knowledge that travels through them will have a transformative effect on both markets and the organizations that serve them. Hardly a single aspect of business will be left untouched. Organizations are already taking on the "network" shape of the new tools we are adopting to do our work. Changing our tools not only impacts how we work, but how we create value.

The potential contribution of these networks needs to be effectively harnessed in organizations not only at the tactical but also at the strategic level. This is where the formulation of knowledge strategies and the associated development of effective content/collaboration platforms will play an essential role. Organizations can tap into the full potential of these networks by developing virtual teams, knowledge communities and expert networks.

### **The Impact of New Collaborative Technology on the Organization**

Clashes between formal and informal ways of working have already started to occur in many organizations. The formal hierarchy will more than likely remain the main custodian of direction setting, performance management and resource allocation. This dimension will now be complemented increasingly by an emerging dimension of networks where knowledge will be exchanged freely. This will be the avenue for the development of both individual and organizational capabilities. Both dimensions will need not only to co-exist, but also to complement and reinforce one another.

Inexorably, we are moving towards a networked hierarchy whether or not management makes this an explicit choice.

Technology will continue to evolve to the next level of virtual quality and bandwidth with more and more effective communication channels. Of course, the technology tools and the processes available still fall short of supporting the full breadth of social needs for effective human interactions. The key challenge of technology is to make virtual interaction more real, more complete, and more closely resembling face-to-face reality. However, organizations can't afford to wait until this integration is achieved. Organizations have to jump in and evolve as the technology improves. Otherwise, they will be so far behind in incorporating technology into their work processes and culture that they will never catch up.

### **Convergence of Content and Collaboration**

Is knowledge a 'resource' or a 'capability'? The former assumes that knowledge is a finite resource and defines the role of technology as providing 'containers' for accessing and applying this resource. When seen this way, knowledge is accessed as needed to avoid the duplication of effort.

The metaphor often used to describe knowledge is that it is a finite resource that lies "inside" the human head. This 'container' metaphor for knowledge implies that since 'heads' are finite, its contents can be extracted and put into another container - the electronic database.

This view may work for simpler, more straight-forward applications of knowledge to pre-defined situations. However, it falls short of capturing the full potential of

technology as it currently exists: to collaborate and exchange knowledge effectively. If you take experienced and knowledgeable people and you present them with a challenging problem, new knowledge is generated that could not possibly have been extracted as a finite resource. The knowledge does not pre-exist the situation, but it is actually generated in the engagement between experts and the problem or, even better, between the cross-disciplinary team and a new challenge. It is clear that this more complete definition of knowledge has significant implications for organizational performance.

Even if you could somehow "freeze" a person's state of experience and knowledge and contain it somehow, they could still generate beyond this an infinite body of explicit knowledge through ongoing engagement in different contexts. It is a misunderstanding to think that we can somehow capture the knowledge held by people and organizations and put it into the containers now being provided by technology. Rather, knowledge is best seen as mostly tacit 'value in waiting', ready to be realized through relationships and interactions. From that point of view, we do not contain knowledge as much as we are contained within knowledge which 'lies in wait' to be created as we resolve problems and meet challenges. As an example, this is the difference between reading a book by an expert and having the expert in front of you to engage in discussion on real problems as they emerge.

This view of knowledge becomes more relevant with the emergence of networks and the enabling technology supporting more effective collaboration at low transaction costs. It implies the recognition of the relevance of social interactions and collaboration in exchanging and creating

knowledge. To espouse this view requires an entirely different frame of reference than the one guiding the early knowledge management efforts, which considered it sufficient to digitize massive amounts of content and make it available through large depositories. In fact, one could consider the failure of most of these attempts as confirmation of the fact that knowledge initiatives cannot live of content alone. Without question, interaction and exchange are essential to the creation of knowledge that serves a useful purpose.

Although only the tip of the iceberg, it is very useful to capture 'knowledge objects', as they allow us to detect where we can find others, by following the network to the originator of the object. Stand alone databases without collaboration don't work because people need to validate what they read with "live data" provided by someone they trust. The ability to provide dynamic access to content remains essential but incomplete. You can't fill a database through the use of unique, intriguing questions, precisely because their uniqueness and infinite variety make them unsuitable to the database. This logic leads to the conclusion that knowledge resides in the networks which are now made readily available by technology. Collaboration and the conversations that take place in networks become essential because conversations provide the context required to be able to take action with confidence. Collaboration therefore constructs relevant and innovative knowledge which cannot possibly be obtained through pre-defined data structures in containers.

When knowledge is seen as a capability, technology has the role of providing a platform supporting knowledge processes and tools. The tremendous power of the emerging technology resides in its ability to

provide a platform for collaboration and the dynamic generation of relevant content, shaped and validated in the fire of the action.

With an integrated platform for content and collaboration, technology enhances capability by leveraging the way people work and collaborate. Innovation and capability development become embedded in how work gets done, which ultimately drives competitive advantage in the marketplace.

### Knowledge and Innovation

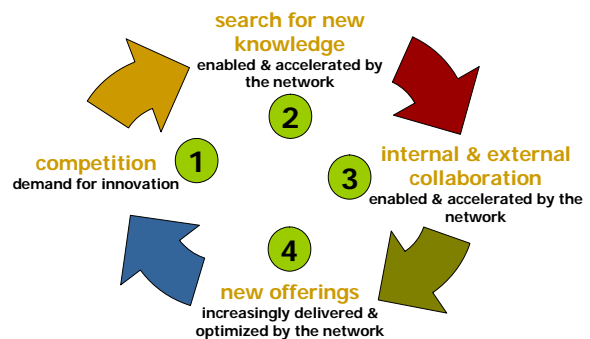
In the end, competitive advantage can only be sustained with innovation. Sustaining advantage within competitive markets requires continual innovation in response to customers, competitors and changes in the business environment. At its core, innovation is about bringing together new combinations. Innovation requires collaboration both within and across organizations. It resides in the ability to mobilize and leverage diverse capabilities to meet customer needs in new and unique ways. An important new source of innovation is coming from collaboration with customers and suppliers where complementary capabilities create new knowledge and unique value with customers. (Pralahad and Ramaswamy, 2004)

Far from the lone inventor in a lab, innovation in today's organization mostly

takes part as a result of interactions with people focusing on a problem or a challenge from different perspectives, or even different disciplines. It tends to come out of debates and clash of perspectives that are not-linear and do not follow a rational, step by step approach.

Often, in their pursuit to become more innovative, organizations seek to introduce structured processes geared to generate innovations. These processes are juxtaposed on top of the work getting done. Employees place their innovative ideas in this bin. An extensive review and triage process is put in place to sift through the ideas and then testing and refinement ensue. While these approaches have their place, many such initiatives eventually collapse under the weight of the processes required to go through the pile and determine the feasibility of the ideas submitted..

### markets, networks & innovation



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However, working within a collaborative vessel where everything is shared and available will naturally lead to pattern recognition and bring together elements that previously appeared not to fit together. From this perspective, it becomes clear that capability development and innovation go hand in hand. A highly performing virtual team or community of practice will have a natural ability to be innovative. With the emergence and growth of networks,

organizations are exposed to external information to an unprecedented extent. In these networks, where there are no rigid controls placed on what is discussed, we will see a greater propensity for innovation as well as capability development. The nurturing of highly collaborative networks which connect internal and external vessels of collaboration will have significant implications for enhancing the competitive advantage of an organization.



## **A New Framework for Leveraging Knowledge**

Strategy for collaborative knowledge There are two key components to a comprehensive knowledge strategy: (1) knowledge access (contained in the intranet), and (2) knowledge exchange, carried out through communities of practice. A clear distinction must be made between the different forms of collaboration that support a knowledge strategy. With the increased popularity of communities of practice, there has been a tendency to call any form of virtual collaboration a community of practice. Yet, there are fundamental differences between a virtual team, a community of practice, and an expert network. The chart below reviews the features of each.

The knowledge strategy must take into account that it will evolve over a number of years. It represents a major intervention in how work gets done and it will ultimately transform the culture of the organization but it needs time. This diagram plots the progression of a knowledge strategy that over time transforms the culture of the organization towards greater levels of collaboration as it embeds interactive, collaboration technology on an enterprise-wide basis. The vertical axis shows the development of an organization's ability to increase the learning and collaboration through a shift in culture. The horizontal axis represents the increased integration of collaborative technologies with a content/collaboration platform.

In the formulation of the knowledge strategy, the timeline and the sequence of activities for implementation are critical. A number of initially successful efforts have flagged when a company has prematurely declared 'knowledge to have been embedded' and dissolved the teams associated with the initiative. There is

evidence, for instance, that this has been the case at British Petroleum. Although there are striking examples such as Caterpillar and IBM that seem to be coming close to the third level on the diagram, there is no sign of any organization reaching the fourth.

When a comprehensive approach is adopted for putting in place a knowledge strategy, it is notoriously difficult to quantify the business outcomes in financial terms. Still, as outlined in the table below, a few companies have made public some of the results of their work in this area.

## **Virtual Teams**

Virtual teams are groups of people working together towards a common goal or purpose and using technology to transcend geography and time. These teams can either work together on a long-term, more sustained basis or can work on specific projects with a pre-determined end-date. Virtual teams that span both suppliers and customers are getting more common as the values creation cycle becomes more complex, with tighter timeframes for delivery and other specifications.

The ingredients for the success of virtual teams are generally the same as for all other teams but they require more discipline in the way they are run: the goals and accountabilities have to be clearer, tasks must be better defined, conflicts and disagreements have to be addressed faster and more effectively. This is why virtual teams tend to require sharper processes and greater embedding in their virtual platforms to function at peak levels.

Effective collaborative work spaces are essential to a high performing virtual team. They allow team members to:

- Engage in discussions on variety of issues and themes
- Access to decisions, rationales and commitments
- Refer to past discussions
- Access goals, objectives, tasks, schedules, meeting information, member information

An effective collaborative space also provides the ability to manage the content of the team, including the version management of documents. It is important that the organization selects a standard set of both synchronous and asynchronous tools which support multi-channel communication for virtual teams. As members of the organization go from team to team they can readily work with tools that are familiar to them. Although these requirements sound quite basic, relatively few organizations have provided effective collaborative spaces to virtual teams and communities.

### **Communities of Practice and Knowledge Communities**

Communities of practice that share expertise to solve problems and improve the work practices have existed for centuries. They have re-emerged more recently as a key tool for sharing, learning and building knowledge with the help of collaborative technology. New group knowledge is created as members of the community trade experiences and anecdotes to solve problems, possibly engendering innovation with new solutions.

Communities function on the basis of productive inquiry, which by definition is tied to action. When members encounter a new issue or a situation, they turn to other members for advice. Because they co-opt the members who themselves need knowledge, communities are the most

efficient and effective way for the organization to generate knowledge.

The role of the organization and its leadership is to:

- Endorse the approach
- Provide effective technology based vessels and infrastructure
- Nurture their evolution
- Engender their growth across the enterprise.

A key source of innovation springs from close interactions among participants in a community of practice that have developed the ability to have productive conversations. In these dialogues, assumptions are questioned as a matter of course and people are committed to build on one another's ideas. This high trust vessel for exchange can contribute significantly to elevating the innovative quotient of an organization.

Once they become a more pervasive feature, communities of practice will eventually transform the DNA of organizations at a very fundamental level. Cross-functional pursuits, enterprise-wide initiatives and client-service teams will become the norm, an integral part of the organizational fabric. As this happens, the architecture of the whole organization will change gradually, fundamentally altering the DNA of the organization. This will affect the leadership mindsets in the organization, work processes and the systems that support them.

### **Implementing a New Generation of Knowledge Strategies**

*Deploying technology in support of collaborative knowledge.* Technology in the area of content, networking and collaboration has become more integrated with the business and with work processes.

The priority now needs to be focused on deployment and utilization rather than on making the technology work. Doing so ensures that technology does not become a commodity and unlocks the potential for creating competitive advantage.

For many senior managers, once they install software in their infrastructure labeled 'knowledge system', they assume they have successfully completed their knowledge work. The reality is that 'knowledge system' is an oxymoron and has sometimes been used in a misleading manner by software vendors. Software can make information available but for it to turn into knowledge, people must collaborate and work with it. Technology is essential for effective knowledge exchange, but by itself, it is insufficient.

It is in this context that the following key issues are identified with regards to the application of technology to knowledge links and collaboration:

1. Word-based information must not be fragmented into different applications and databases. It must be unified without actually having to move the data.
2. Technology must be deployed in a way that embeds its functionality in everyday work practices.
3. The right functionality has to be provided for the task to be carried out. Organizations can bundle a standardized offering that can be configured differently for the specific needs of a collaboration vessel. The standardized offering allows members of the organization to take part in different projects with familiar tools. Consistently deployed, this bundle of functionality will provide an integrated

platform where access and exchange can take place across the organization without technology barriers.

4. To ensure easy access, the information architecture must be built systematically. It should also be preserved on a consistent basis as interaction among different groups organically generates information. If a standardized taxonomy and architecture is not put in place early on, eventually the content will have to be retrofitted with the potential loss of information.

### **Organizational and Leadership Challenges**

*Changing the way the organization functions.* While the accountability spine of the organization will need to remain in the form of a hierarchy on a vertical axis, there is a key need to complement this structure with a vibrant horizontal axis of cross-enterprise collaboration. The need to move faster and to provide customers with integrated solutions makes it imperative.

Recognizing the value of self-governed structures represents a significant challenge for both organizations and their leaders. Do these organizations have the necessary culture to position to succeed in the knowledge era? Are they able to identify a knowledge strategy committed to leveraging the true value of its knowledge capital? Do they have the energy and resources to embrace a new way of thinking – one that challenges some fundamental beliefs? Giving up the traditional leadership model that exercised command and control as the primary strategy for managing human capital and processes will not be something that can be achieved overnight.

***Changing requirements for effective leadership.*** Leadership practices will need to change in order to take full advantage of technology-enabled collaboration. Creating value through networks consists of constantly reconfiguring teams and capabilities. For most, this will require a new leadership style and a focus on creating an environment conducive to trust and collective ownership. Effective leadership in such an environment will be geared to elicit commitment and ownership from employees in a partnering culture.

Managers will need to learn to manage without direct control. In a network of collaborative spaces, employees will belong to multiple communities and virtual teams. They will need to develop their interpersonal skills, learn to share knowledge, effectively collaborate, and increase their abilities to multi-task and innovate.

The new role of the manager is depicted in this diagram showing the importance of detecting and responding to new trends, as well as partnering and generating capability. Infusing meaning and creating coherence in a fast moving environment is at the heart of the manager's evolving role.

An added challenge will be to facilitate a robust interchange internally and externally with customers and partners. This will require managers to give up direct control, remain fluid, and yet maintain organizational coherence. In optimizing performance, the key managerial contribution becomes that of managing interdependencies through boundary-less partnering.

### **IT's Leadership Role**

There is no ignoring it. Every day IT grapples with ways to achieve better

collaboration and to improve the flow of knowledge across the organization. In most organizations, IT is expected to provide the technology and processes to bring people and information together. Pressure continues to mount on organizations to create productive networks.

Although not always evident, there is a major shift in the works. Computing number-based information will no longer be the primary focus of attention for IT. At least equal attention will now need to be given to word-based information. There is no sign that software will bridge the chasm between number-based programs and word-based content and collaboration programs. What is commonly referred to as unstructured or soft data will consume a great deal of its attention in the future. This is where IT can more significantly add to the competitive advantage of the organization.

IT will invariably be asked to provide the tools and processes for content and collaboration. This is uncharted territory for many, including IT. In fact, most organizations have content management and collaboration technology, even if it is the 'reply all' button on e-mail. Although everyone complains about the number of e-mails, few see themselves moving to the pull-mode of collaborative vessels, because the tools are so user unfriendly. It is most often the relative awkwardness of these platforms that is the obstacle to entrenching them into work practices.

Add to that issues related to the organizational aspect of deployment. IT people now need to understand 'organizational ergonomics' surrounding the adoption of a content/collaboration platform. They must take into account aspects such as work habits of people and the underlying culture. They need a more in depth

understanding of organizational dynamics and change management: they need to understand how people work in order to be able to assess what tools they need to get their work done.

This implies the adoption of different skills and approaches attuned to how people use technology to collaborate. It is clear that technology alone will not do it. Technology, in this context, is absolutely essential but totally insufficient. The question is whether IT is ready to tackle the 'socio' part of the socio-technical equation in supporting collaboration and knowledge exchange.

The good news is that this emerging priority will give IT increased relevance in the organization. The bad news is that new expectations associated with this do not play to what has traditionally been considered IT strength. Yet, there is no choice. If IT does not come to the fore with the expertise required, these services will come from somewhere else in the organization. Or worse, rogue technology will start to be used from open source software proliferating in the area of collaboration. Collaboration software can be accessed through the net at no or very little cost. The sudden popularity of blogs, wiki's and other peer-to-peer (P2P) software only attest to this. The implications are significant for the organization not only in terms of security but also in segmenting the knowledge base of the organization.

One key issue is that of providing effective spaces for virtual collaboration. IT often believes that everything is in place for people to collaborate easily and effectively, but this often does not correspond to the experience of users. We know that users will only use these tools if they add to their perceived level of efficiency. If they find it

too difficult to collaborate with the virtual tools available, they will simply refuse to use them. Only once those basic technology components are in place, can IT meet the needs for greater interdependence either internally or externally.

For the most part, the use of collaborative tools has been stymied because the deployment approach has focused almost exclusively on technology issues. However, IT must support processes through consultation and involvement of the people using the technology. This is in part why the governance structure of a project to deploy a content/collaboration platform will play a very significant role in fostering adoption.

To be successful, there has to be a connection between the content and collaboration strategy and the business strategy of the organization. The substantial investment required to build a content/collaboration platform can only be justified with business logic that gives priority to business strategies.

***Recommended Action:***

1. Develop awareness with IT staff and business leaders about what an effective content/collaboration platform could represent for the organization.
2. Bring together a cross-functional group of business leaders and IT staff to formulate a platform that is linked to the strategic drivers of the organization.
3. Put in place a multi-tiered governance structure that will ensure the right level of business sponsorship to engender the shared ownership of this platform.

4. In the course of formulating the strategy, identify the key business applications that will justify the investment in the platform.
5. Define the different phases of implementation and the results to be obtained at each phase.
6. Experiment and renew the strategy as you go along.

### Conclusion

Networks are here to stay: With ubiquitous computing and exploding bandwidth, their presence will become more prevalent. They will link organizations and boundaries will become increasingly blurred. If organizations resist these trends, they will gradually become irrelevant in the market place. Instead of viewing them as a threat, organizations have to create strategic advantage with what networks have to offer both internally and externally. These networks cannot be ignored without endangering competitive strength.

As networks take shape within and across organizations, it is becoming critical for organizations to develop a knowledge strategy that will effectively leverage knowledge across these networks and manage the exchange of knowledge. These networks, rogue or otherwise, will continue to emerge and a knowledge strategy is the most effective way for an organization to manage the risks and opportunities they present.

Effective intra and inter-firm collaboration is critical to the innovation required for sustaining competitive advantage. Building collaborative networks will make it possible to combine the core competencies of the firm and those of its suppliers and

customers, resulting in unique, integrated customer solutions.

Embedding collaborative technology and processes into the way people get their work done will have a transformative effect on the culture of the organization. In particular, it will impact the extent to which members of the organization will collaborate.

The exchange of knowledge is what fuels and sustains successful collaboration and networks. This depends in large part on the technology that underpins the access and exchange components of the content/collaboration platform. The ultimate aim is seamless, ubiquitous access to any information and any person who can put such information in the context of relevant experience. The key to IT's success in this work will be in meeting the needs of those using the technology. This implies a key shift in IT priorities from infrastructure development to shaping end user applications. Instead of focusing on technology and its functionality, it will require focus on and commitment to the end user experience.

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Hubert Saint-Onge is the founder and Principal of SaintOnge Alliance. Drawing from his senior management positions in leading companies in the oil and financial services industries, he developed The Knowledge Assets Framework. This model strategically integrates business plans with branding, leadership and people management in order to optimize an organization's performance. He was identified as one of five practitioners around the world who have had the most impact on organizations according to authors Prusak

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## KM CONFERENCE UPDATE

By Jane Dysart © 2008

### **KM World & Intranets 2008: Themes**

Knowledge management (KM) as a term means something different to everyone. However, as a concept, KM encompasses the strategies and practices that enable knowledge sharing in any organization. KM, like any other business strategy or practice in an organization, requires executive support. Stacy Land, author of *Managing Knowledge-Based Initiatives: Strategies for Successful Deployment*, addressed the topic of executive support. Aligning with the organization, through context and connection, was definitely a major theme at the conference this year. Dave Pollard, VP of Knowledge Development for the Canadian Institute of Chartered Accountants and author of the popular How to Save the World blog, discussed how:

- Content sharing is moving from just-in-case central repositories to just-in-time canvassing of networks and experts
- Best practices are yielding to context-rich stories and visualizations
- The millennium generation is abandoning email and groupware in favor of simple, real-time messaging and collaboration tools
- Websites and other top-down information publications are losing ground to interactive, multimedia, peer-to-peer networking.

This theme was reiterated by the head of KM from Capgemini, Yves Noble, a global IT service provider with more than 80,000

employees in 30 countries. He talked about how the organization is moving from a legacy, document based KM system to a much more interactive and people oriented system focusing on connecting people together to share knowledge rather than collecting documents. This new environment relies on a decentralized, adaptive model, allowing for distribution of management and control activities to individuals. Gordon Vala-Webb, National Director for KM at PriceWaterhouse Coopers, also discussed how KM 2.0 boils down to the networked enterprise driving and ensuring business value by linking hearts and minds of knowledge workers. He illustrated how to align the tools, especially social computing ones (like RSS, wikis, blogs, shared searches) and practices of an organization to find people, leverage relationships and build trust – definitely requirements for knowledge sharing.

The people side of KM was emphasized by many speakers: Peter Andrews, Innovation Strategist & Senior Computing Faculty Member, IBM Executive Business Institute talked about how people drive Web 2.0 and that participation is required. John Husband of Wirearchy Work Design Associates and author, *Making Knowledge Work – the Arrival of Web 2.0*, drew on management practice, organizational development and learning, competency analysis, and organizational change theory and practice, to illustrate both successful and unsuccessful social computing and Enterprise 2.0 initiatives. Patti Anklam, author of *Net Work: A Practical Guide to Networks at Work and in the World*, provided a guide for creating and sustaining networks to enhance knowledge sharing in the organization.

Evan Gerber from Experience Design at Molecular shared research findings, user expectations, and emerging patterns for the mobile web – connecting users through the mobile web.

Tools were another major theme at the conference. Whether it was SharePoint, intranets and portals, or the Web 2.0 tools, many examples and lessons learned were shared by representatives from many organizations: Moira Fraser of the New Zealand Parliamentary Services talked about delivering an organization-wide knowledge strategy to provide a seamless client experience across major knowledge applications (internet, intranet, document management system, email, etc.). The Department of Peacekeeping for the United Nations discussed their sharing tools and intranet. Several law firms shared how they support the firm's business objectives and improve their business processes with key strategic tools. HSBC Brazil showcased their intranet and portal and James Robertson, Step Two Designs, announced the winners of the 2008 Intranet Innovation Awards.

Other themes that percolated throughout the conference were enterprise content management and information discovery, innovation, and learning. It definitely is all about applying knowledge sharing to achieve organizational success, driving enterprise innovation and achievement with user-focused strategies, tools and practices.

For a look at the full conference program, check out [www.kmworld.com/kmw08](http://www.kmworld.com/kmw08). For a look at conference commentaries check out [KMWorldblog.com](http://KMWorldblog.com) and the links to other bloggers who were at the conference. Stay tuned for the call for speakers for next

year's event which will be held at the San Jose McEnery Convention Center, November 17-19, 2009.

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Jane Dysart is a Principal of Dysart & Jones Associates (D&J), an internationally recognized leader in knowledge and information service consulting which focuses on assisting organizations in the areas of information management, strategic and business planning, service design, organizational structuring and market positioning, conference planning, information audit, customized workshops, facilitation, team and management coaching. Founded in 1992, D&J has developed a strong track record of working with information service providers in public and private sectors to develop plans, products and services that are as visionary as they are tactical and responsive in a rapidly changing environment. Prior to founding D&J, Jane was Manager, Information Resources for Royal Bank of Canada. She is currently Conference Program Director for KMWorld & Intranets 2008. You can contact Jane at: [jane@dysartjones.com](mailto:jane@dysartjones.com).

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