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The Collaborative Learning Handbook: A Best Practices Guide

By

Sameer Malhotra

Project submitted in partial fulfillment of the requirements for the
degree of Master of Science in Information Technology

**Department of Information Technology
Rochester Institute of Technology**

December 2001

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The Collaborative Learning Handbook: A Best Practices Guide

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Concentrations Areas:

- Project Management
- Database Systems

The Collaborative Learning Handbook: A *Best Practices* Guide

The Collaborative Learning Handbook

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Chapter 1.0

What is Collaborative Learning?

1.1 Definition

According to the mission statement of the Collaborative Learning Organization formed by major US Corporations such as 3M, Kodak, Shell, Hauser etc., "Collaborative Learning has been defined as creating a process for revealing, using and sharing tacit knowledge" (ONLINE 1). It is a business practice that aims to discover explicit and tacit collaboration tools, processes and knowledge through experimenting in a way that helps to create new knowledge. Collaborative learning employs experimentation, methods and approaches that emerge from the present situation and evolve as they are practiced. This method of exploration has been termed as "action research, originating from the work of Kurt Lewin" (Digenti, The Collaborative Learning Guidebook, p. 7).

The fundamental levers that underpin the functioning of collaborative learning revolve around the concepts of organizational learning and cross-cultural communication. In large, complex organizations, these methods facilitate the movement of key knowledge and competencies across boundaries fluidly, and assure that the learning that takes place in one group is transferred back to the organization. The practice of these approaches demands that organizations make a conscious, fundamental shift to tapping into expertise on the spot, in the moment; creating situations that allow that to take place and then generalizing that information to the shared goals of the learning group.

1.2 Why Collaborative Learning?

Creating an effective collaborative learning environment requires a tremendous intellectual and material investment. Hence, it is important to ask: why should an organization be concerned with collaborative learning? The reasons that favor the creation of a formal collaborative learning environment can be put into two broad categories: Organizational and Economic.

Case for Collaborative Learning: The Organizational Imperative

According to Dori Digenti, a former Director of Training and Special Executive Programs at MIT and a prominent industry consultant on collaboration and learning "Collaborative learning competence enables organizations to deal with both the pace and direction of change as they come; second, because collaborative learning builds boundary-spanning skills; and third, because collaborative learning needs a practice field, a group in which learning experiments focused on building and enhancing interdependence through personal learning networks can take place" (Digenti, "Collaborative Learning: A Core Capability for Organization in the New Economy", p-45). Collaborative learning is important for the following reasons (Digenti, The Collaborative Learning Guidebook, p. 8):

Why is Collaborative Learning Important?

- Collaborative learning helps create processes for revealing and using tacit knowledge. The knowledge that is resident in one individual's head can hold the key to new approach or an innovation for another individual or group. Group interactions render this tacit knowledge useful. On the face of accelerating change, it is this current of ideas embodied in networks of people that create value and competitive edge for organizations.
- Collaborative learning helps organizations avoid the trap of "data exchange", transcend cultural blind spots and facilitates exchange of tacit knowledge that can potentially lead to transformational changes.
- Forces the managers to change their fundamental mindset, question every assumption, invest in intangible assets of knowledge, people and networks; and be ready to diversify and reconfigure rapidly. This would help companies put effective, self-evolving and robust processes in place that would utilize people's soft skills that more often than not remain severely under-utilized in most work environments.
- Traditional supervisory skills are becoming outmoded. New leadership models require skills that involve focus on project work, flexibility and consensus building. Learning through and from collaboration builds the persuasive skills necessary to overcome the organizational inertia, navigate political rough-waters smoothly and move forward.

Case for Collaborative Learning: The *New Economy* Imperative

During the past decade or so, the global economy has undergone a radical shift with wide ranging implications. For much of the Twentieth century manufacturing was the economic engine of the developed as well as the developing world. Now, technology has taken the center stage in what is now called the knowledge economy. To be sure, manufacturing activity as well as consumption continues to grow at an unabated pace but the revolutionary advances in information technology have radically transformed the way in which every business runs its operations. The ever-widening demand-supply variance of qualified software professionals has lead to rapid globalization of software development and the emergence of *virtual team organizations* dispersed over different corners of the world and yet working on the same projects. A detailed look at global software development and virtual team organizations would convince even the greatest skeptics that collaborative learning is not a choice but a necessity to stay competitive in the global economy. Collaborative learning is perhaps the natural complement of global software development and virtual team organizations.

1.3 Collaborative Learning and Global Software Development

Global Software Development: Industry Drivers

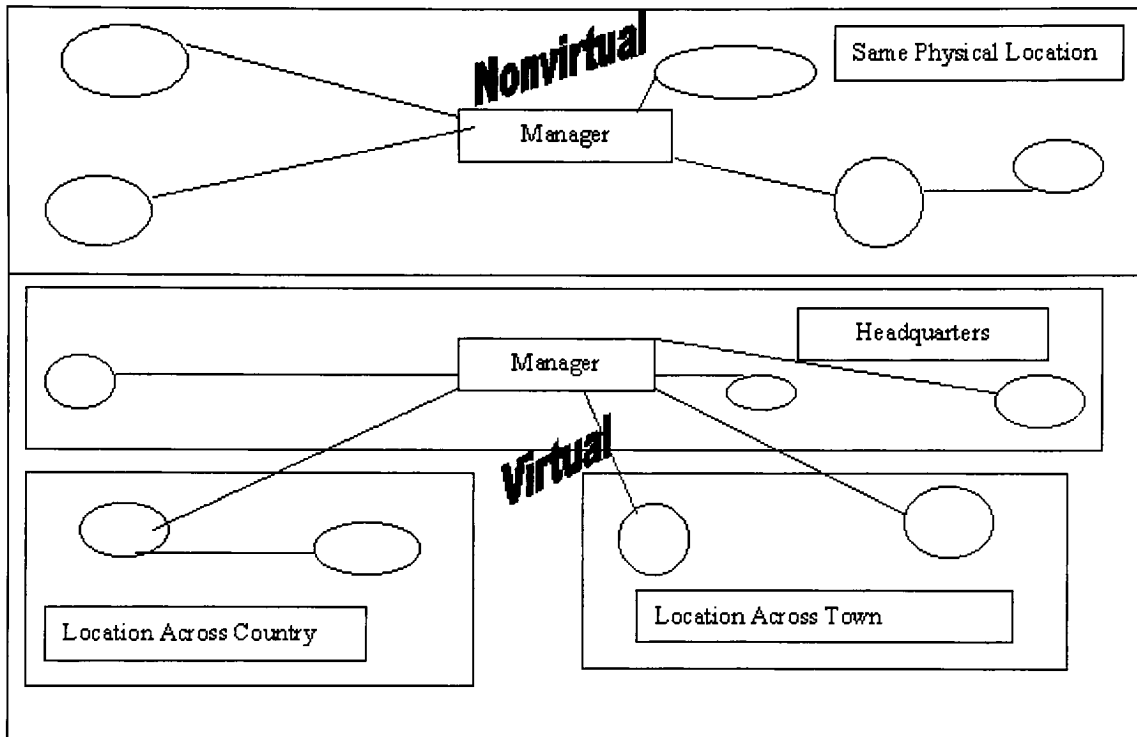
- **Supply and Demand:** Until the early 1980's, approximately 75 to 80 percent of the world's software was being produced in the US by the local developers. However, by the mid-1990's, as the US followed by the rest of the world fully woke up to the PC revolution unleashed by the Internet, the demand for software developers began to far outstrip the supply of developers within the US. The increasing demand-supply variance of software professionals has been driving up costs. This has forced the companies to look beyond their borders for software development work. The current market for outsourcing or co-developing software outside the US is estimated to be around \$50 billion (Karolak, p-2).
- **Global Market:** One of the strongest industry driver is the shift from a predominantly US to the global market. Although the US is still the largest producer of software, the global software market is estimated to be more than \$120 billion. Thanks to falling price-performance ratio of the computers, the

market for software development and products has been growing faster in the rest of the world than the US. Major companies like Microsoft, Adobe, Sun Microsystems, Cisco etc. for example derive nearly half or more of their revenues from global sales.

- **Business Drivers:** Strategic partnerships and joint ventures are also driving global software development.
 - **Strategic Partnerships:** Increasingly companies are relying on strategic partnerships to develop and promote their software products and gain market access/develop new distribution channels. Often one partner may be responsible for development and maintenance while the other may be responsible for working with local customers. The more shared the responsibilities are, the more complex the alliance is.
 - **Joint Ventures:** Most joint ventures result in a separate company being formed that has fiscal responsibility to the joint venture partners. Division of ownership of the resulting entity determines their influence and activities. Joint ventures are subject to the legal jurisdiction of the country where the partners want to do business. Joint ventures tend to have more financial pressure to succeed and hence a greater openness to the global software development option to keep the costs low.
- **Global Companies:** Given the recent trends, the global companies have opted to synergize their diverse capital and human assets resulting in competitive advantages such as (Karolak, p-8):
 - Market network and presence of an existing product helps a new product because the personnel know the customer and are familiar with support facilities.
 - Combining diverse technologies and expertise allows them to realize economies of scale, provides needed resources and keeps fixed costs low.
 - Each location can focus on a particular technology niche or part of the customer base.
 - Ability to merge divisions or companies and still keep separate locations.
 - Can acquire other companies and their products and their technologies to complement their business strategy.
 - Can migrate or establish a technology center at a different location

Virtual Software Organization Dynamics

One of the major distinguishing characteristics of a virtual organization is that parts of the project are not co-located but *behave as if they are*. This ability to behave as if they are co-located determines the success of a virtual organization.



Managing virtual project teams is not an easy task. Every firm that considers venturing into global software development via virtual project teams needs to answer the following questions:

Why Virtual Organization?

- Do business arrangements dictate it?
- Do we want to emphasize our core competencies?
- Do we have enough resources to handle backlogged work internally?
- Is the project compatible with outsourcing?
- What virtual technology would be needed versus what's available?

Virtual Software Organization: Benefits, Risks and Costs

Benefits: Only those firms that are comfortable with the idea of change (technological or otherwise) can benefit most from virtual organizations (Karolak, p-16).

- **Lower Fixed Costs:** Ability to function from locations where operating costs are lower.
- **Lower Labor Costs:** This is one of the major factors that determine a company's decision to go in for global software development. Availability of abundant and low cost software developers and supporting staff makes countries such as India, Singapore, Hong Kong, Taiwan, Philippines, and Malaysia etc. extremely attractive to go for outsourcing/co-development/joint-venture.
- **Increased Morale:** Increasing sophistication of virtual technologies is making it feasible for companies to entertain individual work preferences of talented employees without any productivity losses or costs. This mode of working can have a positive effect on those able to use it.
- **More Flexibility and Project Options:** This is especially advantageous when projects are spread across different time zones. Several American software developers email code and algorithms to their co-developers in India (12 hour time difference) when they go home in the evening. By the time the American developers return to office the next morning, they would have received their code back after being tested and reviewed by their counterparts in India.

Risks: Going into global software development via virtual team projects is not without its attendant risks. Most of these risks are human risks. Though difficult, they are not impossible to manage.

- **Decreased Morale:** The upper management has to make sure the company culture is ready for this kind of work environment. If the employees feel uncomfortable or insecure about the idea of virtual software development, no amount of pressure, incentive or tricks can ensure success.
- **Loss of Face-to-Face Contact:** Tangible and real Human communication is a difficult task even when both the parties are involved in a face-to-face interpersonal dialogue. When it must take place virtually through impersonal mediums, it becomes almost impossible to attain. It evokes feelings of disconnection that no technological wizardry can fully eliminate. A combination of face-to-face and virtual

interaction is recommended for teams that are geographically diverse even though it may involve substantial costs in the short run.

Lack of Trust: There are two distinct but related aspects of trust in a virtual organization, legal and managerial.

- **Legal Trust:** A well-defined and documented mechanism must be established to maintain security and privacy of information. Periodic audits must be followed by a review of fair information practices and other legal issues.
- **Management Trust:** From this viewpoint trust must be earned. Acclaimed management guru Charles Handy lists seven self-evident (but often ignored) rules of trust that management must deal with constantly (Handy):
 - Trust is not blind
 - Trust needs boundaries
 - Trust demands learning
 - Trust must be tough
 - Trust needs bonding
 - Trust needs touch
 - Trust requires leaders

Costs: In the absence of proper infrastructure in place, the costs of setting up and maintaining a virtual organization can be quite significant. Hence, it becomes extremely important for the management to weigh the costs against the benefits. The following are the major costs associated with a virtual organization (Karolak, p 19-20):

- **Additional Capital Investments:** This could include relatively fixed costs such as additional computer equipment, upgrades and supplies as well as high-speed modems, access to high-speed communication lines, additional phone lines, voice messaging system and video equipment.
- **Additional Operating Costs:** These costs tend to be somewhat smaller but they are continuous costs such as additional long-distance charges, communication lease time as well as higher travel expense.
- **Additional Administrative and Project Costs:** These could include group-ware and software upgrades to enhance cooperative work, additional software development tools as well as additional personnel and maintenance costs.

Creating a Virtual Organization: Initial Steps

Elements of a Good Contract: While outsourcing, it's important to draw up an explicit and unambiguous **statement of work** that identifies the tasks that need to be performed (deliverables) as well as the associated time frames. An effective statement of work serves as a legal document and includes the following:

Creating an effective <i>statement of work</i>
<ul style="list-style-type: none">• Tasks or activities to be performed• Deliverables• Location where the tasks or activities are to be performed• Standards or methods to be followed• Time-frame or schedule for tasks and deliverables• Communication/status methods and meetings• Type of equipment/technology to be used• Special interface and performance requirements• Dependencies and miscellaneous items

Investment Capital and Capital Equipment: As part of outsourcing, every organization must decide to what extent it will allow the supplier access to investment capital and capital equipment. Questions that need to be answered in this regard are (Karolak, p - 28-29):

- Is access to certain types of equipment necessary to perform the tasks?
- Is the relationship short-term or long-term?
- What is the payback or benefit?
- Is ownership of patents/technology tied to capital and equipment access?

Responsibility and Accountability Management for Virtual Organization

Cultural Differences: A lack of understanding of cultural differences often leads to disastrous misunderstandings. The following are the most basic issues that need to be considered: (O'Hara-Devereaux and Johansen)

- Some cultures do not promote individual responsibility and accountability?
- Some cultures accept most suggestions without much discussion.

- If things appear too good to be true, they probably are.

It is a good idea to create a basic **ethnography** of the new culture you expect to do business with. The ethnography should incorporate the following issues at minimum:

- Find out how families and communities are structured
- Read up on the history of the culture
- Find expatriates of the representative countries

Organization: Clarity and simplicity should be the defining principles behind organizing a virtual software development team. It is feasible to adhere to the following basic principles (Karolak, p-78):

- Put people others respect and trust in management positions.
- Keep the structure simple and communicate it well
- Assign leaders who are not afraid to travel.

Global software development is as inevitable as globalization itself. Increasingly, the markets are becoming more segmented and more dispersed across the continents. Indeed, it is the continuation and acceleration of this trend that has helped open a vast market for newer and more powerful software all round the world. Managing a virtual software development environment is difficult but the problems are not insurmountable. Only those companies able to face this challenge and take advantage of the diverse software talent available all around the world (and at a much cheaper price too) would survive and define the shifting paradigms of technology and its role in the 21st Century world.

1.4 Fractals and Collaborative Learning

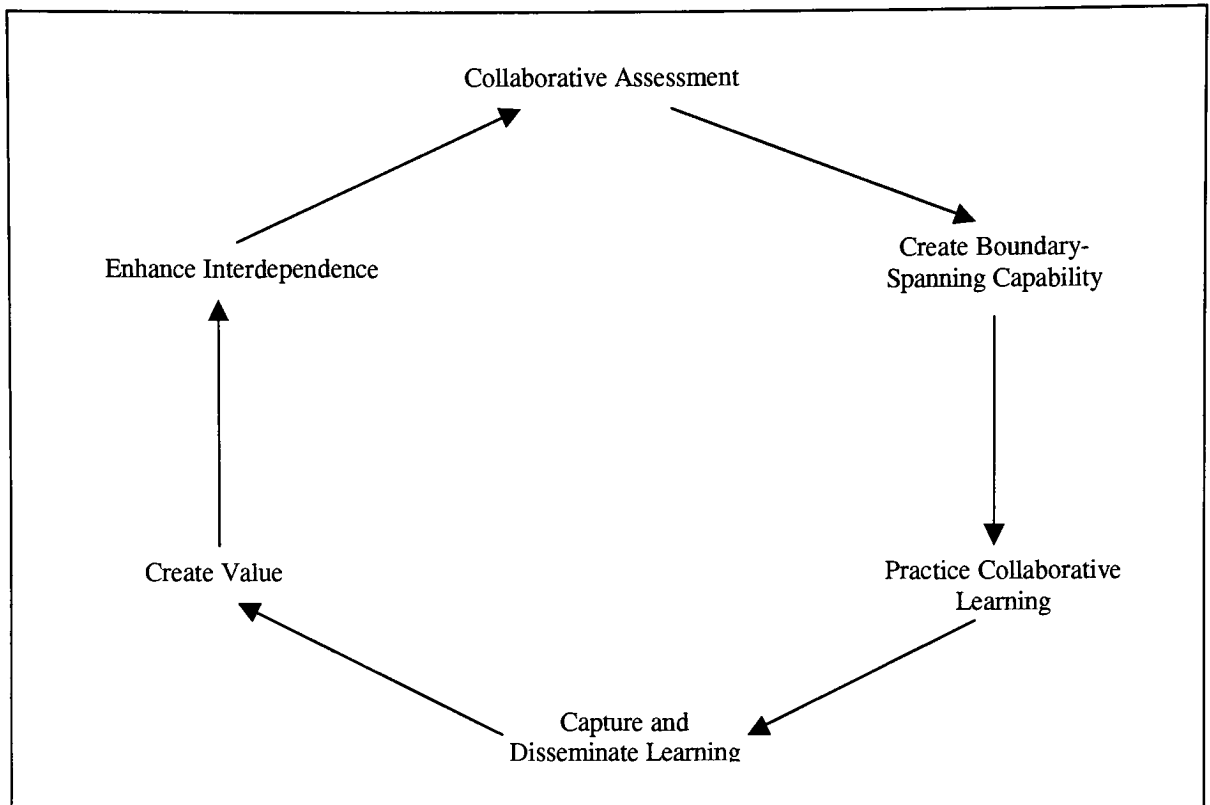
According to Margaret J. Wheatley, "Fractals are mysterious images based on equations that alter as they are fed back upon themselves. Each segment of the fractal is an exact copy of the whole, a concept called "self-similarity" (Wheatley). In simple terms, self-similarity says that the part contains in itself all the elements of the whole. Fractals are evident in various natural formations; they are a patterning that underlies the seeming chaos of objects and events.

Fractals symbolize many of the underlying principles of collaborative learning. The self-similarity of the fractal is evident in the multilevel approach to collaborative learning (self, group, organization, cross-organizational, societal). "The iteration of the fractal equation that creates an evolving form relates to the closed-loop processes of the collaborative learning approach. The underlying patterns in surface chaos echo the peer learning approach, where the collaborative learning group aims to make tacit knowledge concrete, and take advantage of practice-based cases and insights to build new knowledge" (ONLINE2).

1.5 The Collaborative Learning Cycle Overview

It is important to have some sort of a model or roadmap to build, enhance and transfer collaborative learning competence. The proposed model, as an ongoing learning practice, should be of a cyclical nature in which each learning cycle leads to a reassessment of collaborative learning capability, at an increasingly granular level of inquiry. Collaborative learning is a relative new discipline that addresses some important themes and issues of organizational learning. No single model will fit every organization or situation completely. Needless to say, any model or methodology should be adapted according to the unique needs and problems of a company or organization. The diagram below shows the phases of the collaborative learning cycle as proposed by the author Dori Digenti of the Collaborative Learning Network (Digenti, The Collaborative Learning Guidebook, p. 9):

The Collaborative Learning Cycle



1.6 Phases of the Collaborative Learning Cycle

Author Dori Digenti defines six phases of the Collaborative Learning cycle as adopted by the Collaborative Learning Network established by a consortium of leading Fortune 500 companies (Digenti, *The Collaborative Learning Guidebook*, p. 10):

Phase 1: Collaborative Capability Assessment

The purpose of the assessment phase is to exchange data, input, advice and feedback as well as the unique problems and challenges that a group faces with other learning groups.

Phase 2: Create Boundary-Spanning Skills

The set of skills that supports collaborative learning have been termed as "boundary-spanning skills" by the Collaborative Learning Network. These skills allow the

members of the collaborative learning group to develop a shared vocabulary and facilitate work across boundaries while engaging in collaborative learning projects. "The competencies for boundary work can be seeded through workshops and group study" (Digenti, The Collaborative Learning Guidebook, p. 10). The competencies that have the most relevance for a given firm are determined over time through the practice of the boundary work itself. One of the most important elements of the boundary-spanning skills is mentoring of new collaborators as well as mentoring across organizational boundaries. As a result, members with more experience in working with collaborative approaches create an uplift effect for members newly entering thus creating opportunities for mentoring and peer teaching. (Kanter)

Phase 3: Practice Collaborative Learning

Collaborative learning is a practice-based approach; hence every opportunity for collaboration that creates value should be actively pursued. Even though certain types of works may not lend themselves naturally to collaborative activities, still individual collaborators can benefit from collaborative learning around methods and approaches. There are number of highly effective software tools available in the market that serve a wide variety of collaborative functions in an organization.

Phase 4: Capture and Disseminate Learning

One of the most challenging aspects of collaborative learning is centered on the question: *how should learning be generalized and made most useful to the organization?* Some of the most popular approaches include after-action reviews, post-mortems and effective use of internal publications and/or Intranet for publishing stories supporting collaboration. While these approaches have their uses, change agents should also consider unorthodox approaches such as "the creation of a group statement or manifesto concerning collaborative learning needs and results. Humor and drama can also be powerful communicators of the collaborative learning endeavor.

Phase 5: Create Value

One of the biggest challenge within large, dispersed organizations is to create processes for the continues flow and dissemination of knowledge across the vertical and horizontal layers of the organizational charts so that one group does not spend precious

resources and time reinventing that same wheel that has already been invented by another group. For systematic change and improved collaboration to take place, it is important that collaborative learning be disseminated within an organization to benefit the system rather than remaining the preserve of the few. Change agents must facilitate closed-loop processes, actively seeking feedback and engaging in the learning they have received through collaborative activities. The feedback from those activities then helps the organization define and articulate the next learning focus for collaborative activities.

Phase 6: Enhance Interdependence

This is one of the most challenging stages of the Collaborative Learning Cycle especially for the U.S organizations given our cultural inhibitions about mixing business and personal relationships. For any collaborative learning effort to be really successful members need to develop an awareness of how to create strong networks among current and former collaborators and change agents need to foster and encourage that awareness. (Digenti, The Collaborative Learning Guidebook, p. 11).

Given the pace of rapid technological change and the changing nature of the global economy, no professional can claim to possess enough mental bandwidth to maintain learning in all the necessary endeavors one is engaged in. Collaborative learning can only be sustained and utilized effectively in the organization by building interdependence among members. "This is where the Personal Learning Networks (PLN), born of a series of learning collaborations, can be a valuable tool for enhancing and building interdependence" (Digenti, The Collaborative Learning Guidebook, p. 11)

Chapter 2.0

The Collaborative Learning Case Studies

The case studies and project examples presented in this chapter are derived from real situations in an actual corporation. While, the projects and examples presented here might be unique to this particular corporation; the issues, challenges and premises they underline and expose are common across all major large corporations of its kind. The company and project names have been deliberately changed to protect their identity.

Company Profile
<p>SolarSoft, Inc. is a large, Internet infrastructure company that has emerged as a market leader in supplying high-end end-to-end computer systems and solutions to large corporations, universities and governments worldwide. In the Nineties, SolarSoft caught the first wave of the Internet boom growing annually at rates of 40-60 percent.</p> <ul style="list-style-type: none">• Annual Revenues: \$ 20 billion plus• Employees: 43,000• Global Presence: Offices in 45 countries and growing• Leading Products: A leading flavor of Unix operating system, high-end servers, workstations, Network Devices, Storage and popular software systems and programming languages

2.1 The Role of Collaborative Learning in Mergers and Acquisitions

It is common knowledge that almost 75 percent of all mergers and acquisitions fail to add any shareholder value. In fact, most companies that pursue mergers and acquisitions end up driving down overall value in the long run. In the IT industry, failure rate of mergers and acquisitions is over 83 percent. Most often, the reasons cited for the failure of these corporate marriages are: disparate processes, cultural clashes, bad strategy, competing executive leadership, politics, failure to integrate people, technology and processes etc.

In late 2000, SolarSoft acquired Radian Networks, a leading maker of high-margin servers and networks appliances targeted at low to medium end businesses, for a stock-swap deal valued at \$2 billion. This was the biggest acquisition by SolarSoft in its 20-year history. SolarSoft's record of successfully integrating acquired companies had been at best, mixed. SolarSoft saw tremendous growth potential in the low-to-medium end market segment for low cost network appliances. Radian Networks was a small, 3 year old startup company with less than 2000 employees. With its superior products, extremely fast turnaround times and nimble operations, not to mention, growth rates of over 300 percent per year, Radian had emerged as the darling of the markets.

Even though in terms of revenues Radian's annual revenues totaled less than one-half of one percentage point of SolarSoft's, it had seemed like a marriage with lot of promise. SolarSoft would gain a dynamic, backdoor entry into a promising new market with an existing portfolio of superior new products with very high margins, Radian expected to gain economies of scale and access to new cash-rich customers. Besides, the SolarSoft executives involved with negotiating the deal had promised that the core competencies of Radian would be left intact and that the best practices of both the companies would be combined to the long-term benefit of all. All in all, in terms of revenues, people, processes and technology, this was much like a marriage between an elephant and a flea.

A directive came from top that Radian's ERP Systems (Enterprise Resource Planning) and other IT System's should be integrated with those of SolarSoft's within five months to coincide with the beginning of SolarSoft's new fiscal year. A joint integration team was constituted with 4 people drawn from Radian's IT department (including their director of IT) and 4 ERP business and process architects/analysts drawn from SolarSoft's ERP group. Weekly meetings and joint working sessions (with the further understanding to meet as and when necessary) were scheduled to understand and analyze each other's IT systems and processes. An aggressive project plan with specific milestones and deadlines was created and reviewed repeatedly by all concerned. Team members from both the companies were extremely nice and polite to each other and optimism was in the air that perhaps they would be able to beat the deadline by more than a month since not a whole lot of actual integration was needed at the system level.

With three months into the project or just two months before the Go-Live date, the ERP integration project had run into rough weather and every single milestone and deadline had been missed:

- There were some serious **communication problems** between the two teams that were exacerbated by the cultural differences, ego clashes and personal insecurities of the people. The context very much resembled that peculiar love-hate relationship and competing world-views that mar the relationship between the colonizer and the colonized.
- Two of the team members from SolarSoft seemed to have taken a personal dislike for one of the member, Tanya, in the Radian Team within a couple of weeks. Being a non-native speaker of English of East-European origin, her communication was often weak and often indirect. She had a tendency to be extremely repetitive and circular in her communication and to make matters worse, she did most of the speaking in her team. This irritated the members of the SolarSoft team who were native speakers of English and they interpreted this as deliberate obfuscation and defensiveness on part of the Radian team members. After a while SolarSoft's team members would *hear what Tanya would try to explain, but they had stopped listening*.
- Employees of the Radian Networks took an extreme pride in their company and their products. It was only natural for them to feel defensive and display a certain aggression on being acquired all of a sudden. They felt as if they were under siege by this larger company that had acquired them. For example, in the very first week, the facilities department of SolarSoft changed all the doors of the Radian buildings to comply with SolarSoft's building security standards. This happened before the Radian employees even had a chance to get new swipe card ID's. As a result people couldn't get into the building unless someone came in from inside to open the doors.
- In the very first meeting, SolarSoft team-members got shouted at by one of the sales team-leaders from Radian's Sales force who're worried that their

commission structures would get disrupted and that they won't be able to get sales forecast data in a timely manner after the integration.

- There was no clear line of command or mandate for the project. There was no executive sponsorship and it infuriated Radian members to no end that they could not identify or reach out to their counterparts in the vast, hierarchical SolarSoft. They felt lost and directionless.
- SolarSoft team members requested to see demo's of Radian's ERP and other IT systems to get a hand-on feel for them so that they could analyze the systems, map and gap the differences between systems and processes of the two companies and propose remedies. Instead, they were given verbal presentations by the Radian engineers, which they either didn't understand or didn't try to understand. More often than not, SolarSoft's team members would be handed out highly technical manuals or engineering documents by Radian personnel that more likely than not went unread. SolarSoft team members were not getting any closer to gaining even an iota of understanding of Radian's core systems.
- Radian's chief engineering and IT personnel would lose no chance in expressing their frustration rather undiplomatically at times about how their work had almost doubled overnight and from being a lean and nimble organization, all of a sudden five different useless SolarSoft processes that go contrary to Radian's business model are being thrust down their throat
- SolarSoft's was a Unix centric universe while Radian's BTO and Agile systems were Windows NT based. This was blasphemy in SolarSoft's mythology given the SolarSofts CEO's legendary hatred for Microsoft and Microsoft products.
- While everyone talked about cost-benefits analysis, ROI and opportunity costs making business choices, nobody seemed to know what the current supporting cost structures for the various platforms and systems and where to get that financial data, if it existed at all.

- With certain air despondency, all the team members agreed that in its current state, the project would make a classic Harvard Business Review case study of a failed project.
- Much later in the project, it turned out that the contract manufacturers of Radian were not even using Agile System that Radian had been waging a fierce battle to save. SolarSoft people wondered if this suppression of vital information was plain ignorance on part of Radian team members or deliberate obfuscation.

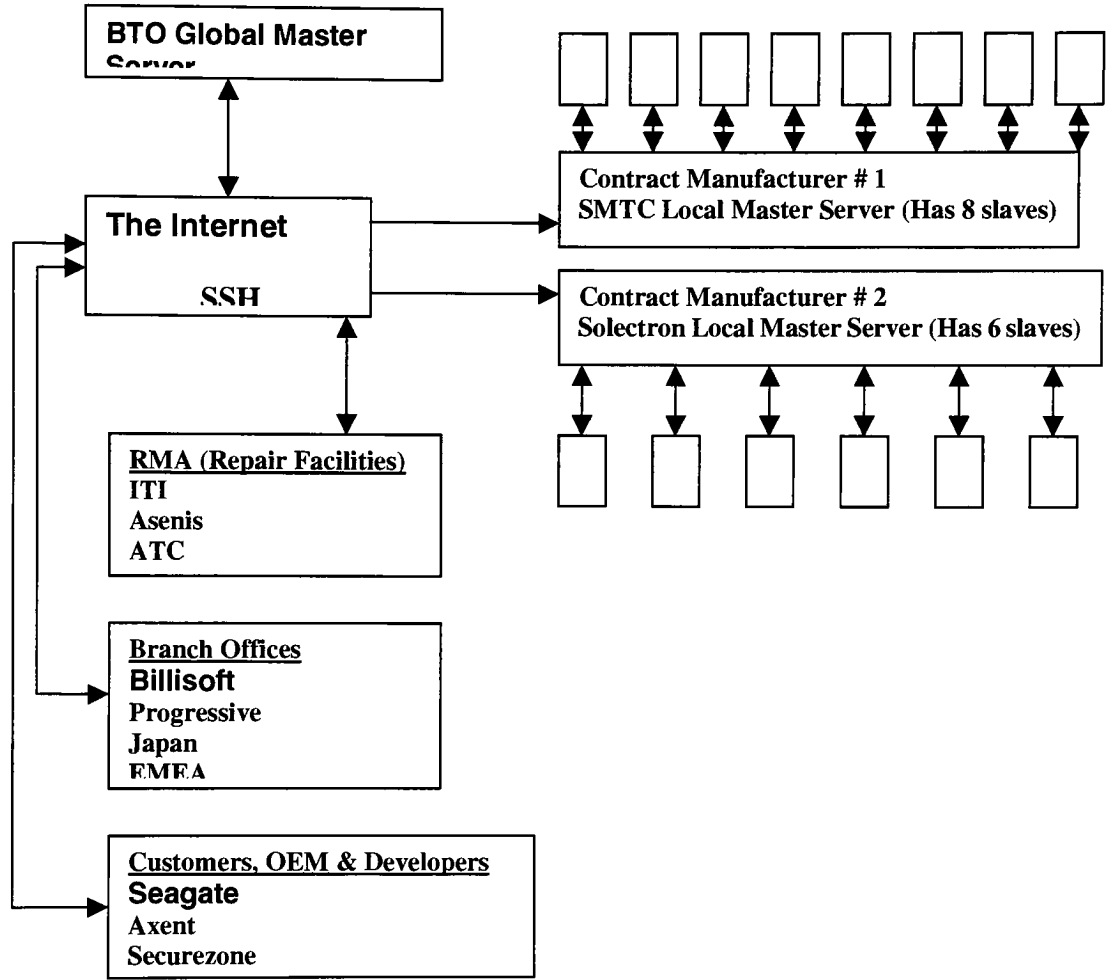
As this endless round of meetings with their evasions, accusations and mutual frustrations continued, there were some minor successes and consensus was reached on few matters that were essentially on the periphery of the whole project. Matter's came to a heads on collision when the Radian's chief engineer challenged that under no circumstance would they part with their existing systems, especially their BTO (Build-To-Order) Server architecture that was like the central nervous system of their business model and Agile, their system of record and distribution. He threatened to escalate this matter to the SolarSoft CEO if need be because if these systems go, their business model with it's low turnaround time and high margins would be effectively destroyed.

Team members from the SolarSoft on the other hand demonstrated little understanding, much less appreciation of Radian's business model and their BTO system architecture. Their attitude was: "You are right, maybe you know more about your business model than we do but your revenue totals less than one half of one percent of SolarSoft's. SolarSoft is not going to change their processes, you're the one's who'll have to change and conform to SolarSoft's process."

Both the companies got their products manufactured through contract manufacturer's like Solectron, SMTC etc. SolarSoft had more complex and comprehensive processes wrapped around every single activity in their business cycle, their security standards were more stringent and they had a more hands-off approach to how their contract manufacturer's handled manufacturing and distribution. Radian's model on the other hand had a far more involving and collaborative manufacturing cycle with their contract manufacturers. Following is

a simplified depiction and a brief analysis of Radian's BTO system architecture and its functionality:

Radian's BTO Server Architecture



Radian's BTO Server Architecture: Major Features

- Radian's Build to Order (BTO) server architecture is essentially a lean and efficient automated manufacturing and quality assurance tool that has all build data and information
- It is connected via SSH secured internet connection to the servers at Contract Manufacturers (CM), RMA facilities, Branch offices, customers, OEM's as well as developers
- While some of the servers are behind firewalls, all transactions are secured by SSH and RSA keys. None of the systems are currently in SolarSoft's Wide Area Network.
- BTO global master has access to customers, OEM'S and developers but they don't have access to the BTO global master
- In case the local master server at SMTC or Solelectron location goes down, one of the slave server reboots, synchronizes and automatically takes over the role of the local master server at SMTC or Solelectron location.
- ECO (Engineering Change Order) signoff goes through Radian personnel and is manually put into BTO
- There is no electronic, automatic exchange of information between Agile system (their system of record and distribution) and BTO; new information is put manually from Agile to BTO
- Contract Manufacturers (CM) do have their own quality checks as well but they are not as robust and as reliable as the quality checks done via Radian's BTO

Core Functionality of BTO

- Load software onto the systems being built at the CM site
- Validate and check quality to make sure the right parts are being used for the systems being configured
- BTO is also used to collect metrics, which are maintained in MySQL. RMA quality data is on Access
- BTO is highly flexible and scalable

Core Quality Tests Done via BTO System

Board Test Process is used to test system boards built for Radian products. This test begins with a unit serial number scan and includes:

- Clock Test
- Configuration Test
- SCSI Test
- IDE Test
- Ethernet Test
- Serial Loop-Back Test

Even a casual look at the BTO server architecture analysis would tell an observer that this architecture indeed was at the very center of Radian's core competency indeed. Decoupling BTO from Radian's business was not an option given the current business model and Radian's relationship with their contract manufacturers. Without this or other comparable architecture that gave them the same functionality and performance, Radian's intellectual capital would have been destroyed beyond recognition. But this point was lost on the SolarSoft's team members and Radian's team members didn't do a particularly good job at explaining their own defensiveness, lack of honest communication and ego problems. Finally, more than halfway through the schedule with nothing to show for the project, a steering committee meeting of senior managers and executives from both the companies was called and a consensus reached.

SolarSoft-Radian Integration Fiasco: heading towards a final consensus

- A vice-president from Radian Network gave an honest analysis and mentioned that unless and until they are presented with an option that gives them **demonstrably** same or better functionality and performance at comparable costs, they are not going to abandon a system that works. It would drive their business unit out of business.
- A senior manager from SolarSoft's ERP division acknowledged that BTO server architecture and Agile System is indeed something that works for Radian. But presented the scenario that SolarSoft acquires ten more companies that all have systems that work for them individually but are not aligned with SolarSoft's systems. Over a period of time, say 3-5 years, the overall complexity explodes and key personnel in those acquired companies move to other positions within SolarSoft or outside. This would leave a bloody mess in the overall systems and add hundreds of millions of Dollars of cleanup costs
- A consensus was reached that BTO would be brought within the SolarSoft's wide area network to allay SolarSoft's security concerns and suitable interfaces developed to allow limited access and data exchange to Radian's contract manufacturers.
- It was also mentioned that SolarSoft is looking for new solutions to replace their legacy PDM (Product Distribution Management) system and Agile is one of the

companies short-listed. It was agreed that Radian would keep Agile for a period of one year and they would become involved with SolarSoft's group and help drive the effort to evaluate an overall new PDM solution to replace SolarSoft's legacy systems.

Conclusion

At the time of this writing, a new joint team of SolarSoft and Radian employees had been constituted with adequate representation from business. Agreement was reached that BTO would stay while Agile will have to go within a year. The general consensus was that no significant technical programming work would be required for the integration while the process alignment and integration would require major effort. The Go-Live date for the project stayed largely the same while some of the required process changes were pushed by 3-6 months.

This case study must conclude by listing the leading causes that were cited in the introduction as the major reasons why most merger and acquisition efforts fail: disparate processes, cultural clashes, bad strategy, competing executive leadership, politics, failure to integrate people, technology and processes etc. More often than not, caught between *reality perception* and *reality construction*, people become part of the problem rather than becoming part of the solution. An effective collaborative learning capability with formal programs to developing and disseminate these soft and subtle human skills would mitigate most of these problems. Collaborative learning can help people keep emotions out of the decision making process, introduce effective change management processes that create a win all situation that is good for the business and success of the project. This could be an effective antidote to failures that occur due to miscommunication or competing worldviews and stimulate value addition and innovation within organizations.

2.2 Dispersed, Global Teams and their Unique Challenges: Project SolarRAMP

Background Info:

Beginning in the mid-1990's SolarSoft found itself caught in front of the vast Internet Infrastructure wave that swept the whole world with promises of a

technological Eden that will transform the world in unforeseen ways much like the industrial revolution did 200 years back. SolarSoft became a major worldwide supplier of Internet Infrastructure for established as well as the new breed of corporations worldwide. Business was growing annually at more than 50 percent. Nobody had seen such rapid and sudden growth rates and SolarSoft's ability to sell was hindered only by it's ability to meet the rapid demand for it's products and services.

As a result of this unforeseen and rapid business growth worldwide, SolarSoft started deploying all sorts of systems and applications to manage it's computing needs and IT infrastructure needs. By the year 2000:

- SolarSoft found itself with more than 100 different systems deployed worldwide
- There was very little alignment between these systems and the business processes that they supported. Complexity as well as support and maintenance costs had become simply unsustainable
- Even the original vendors of several of these systems and applications were unable to help because of the massive customizations that had been done over the time to make these systems talk with each other through an elaborate system of event publication and subscription through an Information Highway
- All the ERP functionality was handled in different geographical regions worldwide through Oracle as well as several other legacy and obsolete RDBMS systems such as Axiom, MFG/Pro etc.

Project SolarRAMP Objectives
<ul style="list-style-type: none">• SolarSoft has launched an initiative to achieve global order management process alignment by extending the Oracle ERP implementation to all selling units in all timezones• SolarRAMP is to Replace Axiom and MFG/Pro systems with Oracle• Project SolarRAMP aligns OE (Order Entry) and AR (Accounts Receivable) order management processes, data structures, and systems.• SolarRAMP also establishes common Information Highway events and interfaces for boundary systems globally.

- SolarRAMP is the core global foundation enabler (providing multi-currency and multi-language support for various other SolarSoft initiatives and global business)

SolarRAMP Resources and Budget

SolarRAMP is the most complex and expensive project undertaken by the company in its entire history. Infact, according to some seasoned veterans of the IT industry, no other company in the entire world had ever attempted such a vast and complex deployment of Oracle database and applications at this scale.

- Total Expected Budget: \$100 million
- Total Expected number of developers, business analyst, process specialists as well as assorted project and support staff: 200 located worldwide in several countries in all timezones
- Expected Start to Deployment Timeline: Approximately 2 years

SolarRAMP: Chaos, Challenges and Turf Wars

- This project was one of the geographically diverse and wide-spread project undertaken in the history of corporate America that affected the business of a large multinational in every single continent and economic zone
- This project was disruptive in its scope. It was about changing existing business and system processes radically. While everybody knew that this project is vital to sustain the growth of business, political turf wars erupted in every single business unit in every single geographical region. Not only were the mid-level business managers, IT directors, users and other business stakeholders unable to see the big picture, they often refused to extend the support and cooperation that was vital to the success of the company as a whole

SolarRAMP: Chaos, Challenges and Turf Wars**(Cont.)**

- Besides the turf wars between various managers, battles over resources, manpower, funding and budget became a constant throughout this project. Often managers in different divisions would try to disguise their own specific agendas and get funding from the SolarRAMP project office for changes that were outside the scope or had nothing to do with it.
- Needless to say, communication was a huge problem. In any transcontinental business meeting and/or phone conference people would often be unable to follow what the other person tried to convey due to language problems, heavy accents of participants in Japan, Scotland or other European regions

SolarRAMP: Globally Dispersed Teams and Differing Worldviews

Often the worldview and thought processes of people in different regions were diametrically opposite. Consensual decision-making became extremely difficult. Any attempt by the people in headquarters (California) to impose order or reason over any particular way of doing things was seen as a mercenary and colonial attempt. As a result people would deliberately try to withhold information or project business needs that were blatantly false. E.g. one of the basic premises of this project was to move all the Geo databases on one single high end Computer Box with PST as date-time zone stamp to simplify the business processes and make them more secure. This required additional training and behavioral adjustment on part of users in the rest of the world outside the PST date-time zone. The Japanese managers dug their heels in on this issue. They mentioned that they “require” local date-time zone stamp for their business processes. This was projected as a business and legal requirement while in reality this was neither a business nor a legal requirement; it was just their “preference” so that they don’t have to make changes locally. The subtle difference between “requirement” and “preference” was lost on many people

SolarRAMP: Heading Towards a Storm

Conclusion: At the time of this writing, this project was still going on. Nobody really believed that it would meet the target Go-Live date. A comprehensive analysis of the difficulties and challenges that this project presented is beyond the scope of this paper since that would require a book in itself. By any measure this was a complex and challenging project and no magic wand in the world would make it otherwise but a well-defined and mature collaborative competency along the lines proposed in this handbook would have shifted the focus away from constant firefighting and made the project run much smoother and with less waste of precious time and resources

2.3 Collaborative Knowledge Sharing Across Non-competing Corporations

One of the biggest problems confronting for companies doing business globally is that of multilingual invoicing. The vast majority of countries have very strict and non-standard legal restriction as to what a customer-facing invoice should look like and where local language must be used as opposed to the English language. No ERP system or application currently available in the world, including Oracle provides any centralized, integrated invoicing solution that conforms to the legal as well as Multibyte local language requirements. As a result companies typically end up spending a huge amount of resources on application customizations as well as manual invoicing solutions.

At one of the Oracle Application Users Group (OAUG) technology conference in Hawaii where Oracle Corporation as well as managers of various companies using Oracle Applications meets to discuss current challenges as well as the future roadmap for Oracle Applications, a senior SolarSoft ERP manager developed a good rapport with the director of ERP division of Nextronics Corporation. While discussing the problems and challenges in their respective divisions, they struck up an informal deal. SolarSoft had developed a sophisticated web-based Database monitoring and response application that it decided to trade with Nextronics for their Multilingual Invoicing Engine. Over the next one year, managers of both the companies not only traded internal software developed that took years of effort to develop and cost

millions of Dollars, they exchanged a continuous dialogue, white-papers, executive summaries on various business problems and technical solutions. More than the tangibles, they traded and shared “experience” and “learning” through regular discussions and visits to each other’s companies. At the time of the writing of this paper, this mutual beneficial business relationship born spontaneously out of a chance meeting a year ago had evolved and grown into a vibrant collaborative learning engagement between the two companies.

2.4 Intellectual Capital: Hard to Identify, Harder Still to Deploy Effectively

Notwithstanding the recent collapse of the Internet bubble, the *knowledge economy* is a fact of life in the 21st century. What differentiates a unique, highly profitable, wildly successful company or organization from others in this hyper-competitive environment is the knowledge that resides in that company; the sum total of everything that everybody in that company knows. Not only is such collective knowledge really hard to identify, it’s harder still to effectively deploy that knowledge. It is intellectual capital that can transform human knowledge and experience into a valuable product or turn a commodity like corn into a high-tech product. Consider the following examples and excerpts from a recent article titled “Intellectual Capital” that appeared in Fortune (Stewart. Intellectual Capital: Brainpower):

These examples are sourced from the article titled “Intellectual Capital” in Fortune

- Helios, a state of the art medical imaging system by Polaroid Corporation will hit the market sometime this year after being in the development for just three years. “That’s twice as fast as wild-eyed optimists in the company had predicted. The reason: interdisciplinary teamwork in the labs. Our engineers are not any smarter, says CEO I. MacAllister Booth, but by working together they get the value of each other’s intelligence almost instantaneously” (Stewart. Intellectual Capital: Brainpower)
- At Pioneer Hi-Bred International, researchers have produced special strains of corn that are disease resistant, high yield or have specific

attributes like oil content for targeted users. They have attained this by manipulating the DNA of the plant in a petri dish. They effectively saved millions of Dollars, reduced their product life cycle by several years and saved hundreds of acres of farmland.

- The financial planning subsidiary of American Express, IDS Financial Services, created a software program called Insight that codified the expertise, experience and methodology of its best account managers. “Now even the worst of our 6,500 planners is better than our average planner used to be,” asserts Chairman Harvey Golub (Stewart. Intellectual Capital: Brainpower). The productivity factor: Within four years the clients drop-off rate fell by more than half.

One of the biggest challenges why intellectual capital is so elusive, so hard to identify is because it is intangible. It does not appear on any balance sheet, it's not discussed at annual shareholder meetings; analysts and accountants cannot quantify it, define it or assign hard numbers or metrics to it. The value of Machines, buildings, computers are easy to measure and put on net assets valuations and the balance sheet. “By contrast, Dun & Bradstreet's databases, worth billions, appear on no balance sheet (Stewart. Intellectual Capital: Brainpower).”

Before a company can get more out of its intellectual assets, it has to identify them first. Jeffrey Staley, vice president of Scientific Generics, a management consulting firm claims that odds are that no one in the company even knows what those skills are. Staley with his wide experience in the industry helps companies map their technology assets. He helps companies locate them, define them and lays out a roadmap to transfer intellectual capital to other parts of the company. Citing an example of such a disconnect, he mentions, “one division of AMP knows how to drill minuscule holes in ultra-thin plastic and metal rings to make connectors for fiber-optic cables. Its drillers are the best in the world, and the precision of their work allows AMP to make their connectors for half its

competitors' costs. Yet it wasn't until the company, working with Staley, mapped its technology assets that AMP learned how to transfer the skill to making connectors for copper wiring systems (Stewart. *Intellectual Capital: Brainpower*)."

As technology gets more complex, managing intellectual assets becomes even more harder. Knowledge is in people's heads, it's unstructured and implicit. It's a well known fact that at Xerox, when a repairman finds a faulty part that caused a failure, he logs that information to an information database that guides the engineers to problem areas when they design a new copier.

Depending on the availability of resources and management buy in, companies can form elaborate processes and systems to share and disperse intellectual capital. For example, "Carnegie Group has formed a joint venture with US west, Digital Equipment, Ford Motor, and Texas Instruments called the "Initiative for Managing Knowledge Assets (IMKA). IMKA's aim is to make intellectual assets available through software that links databases, artificial intelligence, and plain old rules of thumb (Stewart. *Intellectual Capital: Brainpower*)."

At a more simpler and humbler level, companies can create opportunities for sharing intellectual assets across functions and divisions by creating opportunities for storytelling at informal gatherings, loosely organized off-site meetings and through audio-video conferences etc.

Even at an informal level, an effective collaborative approach can help companies identify and disperse its intellectual capital. Collaborative learning is not a thing in itself *per se*. It is just a conduit, a tool or a formal methodology or call it what you may, through which people can develop effective modes of communication and a certain degree of interpersonal comfort and trust that facilitates free flow of that "unstructured knowledge" that ordinarily resides in the heads of peoples. Collaborative learning is a broad, flexible framework that can help companies identify, navigate, deploy and manage the elusive, uncharted territory called *intellectual capital*.

Chapter 3.0

Collaborative Learning Enhances Critical Thinking

3.1 A Control Experiment to Study the Impact of Collaborative Learning on Critical Thinking Skills

In her 1995 study published in Journal of Technology Education (Gokhale, ISSN 1045-1064), Anuradha Gokhale examines the effects of collaborative learning in a technological education setting.

While such studies abound at the high school or even the grade school level, few have been attempted to probe the learning habits of college students. In technology, it is likely that students face unique challenges in learning and therefore Dr. Gokhale's article is of particular significance here.

In this study, undertaken at Western Illinois University, students at an undergraduate Electronics course were split into two sections. In one section, learning took place individually and in the other, students worked in teams to gather ideas and master the material.

Both sections were subjected to the same initial lecture on the subject of direct and alternating current circuits. Following the lecture, the two sections were separated and the students were handed (pencil and paper) preliminary tests.

In the individual-learning section, students took the prelim test on their own. On the other hand in the collaborative-learning section, students met in teams of four to discuss the problems in the prelim test and solve them through a collective effort, where every team member's input was considered.

Students in both sections were then handed solutions to the prelim test. By comparing the handout solution to their own, the students reinforced their learning of the subject matter. In the collaborative-learning section, this reinforcement was aided by further discussion among teammates about their approach to each problem.

Finally, all students, in both sections, were handed a final test, which they were required to take individually. The scores obtained in this final test formed the dependent

variable in this study. The independent variable, "section-type," being categorical had two levels, individual learning and collaborative learning.

This final test consisted of two segments. The first with questions of "Drill-and-practice" variety or ones that tested memory and basic comprehension; the second segment had questions of the "critical-thinking" kind that required the test taker to probe deeper and think creatively and make connections between seemingly disjointed topics in the subject matter.

The scores on the final test were compared between the two sections through a t-test for difference in means. Separate tests were run to compare scores in the two segments (basic questions and more probing questions) obtained by students in the 'individual' section against those obtained by 'team' section students.

The null hypothesis in this study is that on average the students in both sections obtain the same scores in each segment of the final test. This states in other words that collaborative learning does not enable students any more than what they would have learnt individually. The level of significance (alpha) was chosen to be 5% , meaning that given this null hypothesis is correct, there is still a 5 % chance that one may obtain a sample that leads to a wrongful rejection of this null.

The results obtained were as follows. In the "drill and practice" segment there wasn't enough evidence to reject the null hypothesis. But in the critical-thinking segment, a large value of the test statistic was obtained which led to a resounding rejection of the null.

The conclusion from this study therefore, is that individuals learn just as well on their own as those who belong in teams when it comes to basic factual aspects of a subject. However, when it comes to developing skills for solving deeper, more probing, more creative problems, being in a team can be a definite advantage. This of course has implications for teaching methods adopted in similar courses.

There are other aspects of group learning that were evoked in this study. Almost invariably, students in the group-section found it a fun, exciting and rewarding experience to work with their teammates. In most cases, teams were able to achieve free and rapid exchange of ideas among members. Only in rare instances did students complain of their teammates slowing them down. But their voices can be ignored for they must surely be social deviants.

Dr. Gokhale further suggests undertaking studies that would include other controls like group-composition, use different group selection methods and even psychoanalysis of the group discussions. Such studies can shed still more light on the nature of group dynamics in a complex learning and work environment.

Chapter 4.0

The Collaborative Learning Capability Assessment

4.1 The Assessment Process

As discussed in the prior chapters, to build collaborative learning, change agents must have some understanding of the collaborative capability that already exists in their organization. Most of the firms are already involved in some sort of internal and external collaborations. They can take advantage of ongoing collaborative projects for assessing capability and building competency in the organization around those collaborations. Though some companies might engage in cultural compatibility analyses on a rather ad hoc basis, few have a clear sense of how collaboration works or does not work in their organization, where the pockets of expertise might lie or what models of collaborative activities are being used internally. Chances are that there is no model or process centered on any well-defined collaborative model.

The collaborative capability assessment is an attempt to do an explicit, systematic analysis of the organization's attitude towards collaboration and the existing systems, support, processes and persons involved in collaboration in the firm. According to author Dori Digenti, "The assessment is a toll for uncovering tacit knowledge about collaboration and for highlighting where there is lack of alignment around collaborative goals" (Digenti, *The Collaborative Learning Guidebook*, p. 12). Digenti proposes a four-step process of collaborative capability assessment as underlined below (Digenti, *The Collaborative Learning Guidebook*, p. 12):

Step 1: Culture Exercise

- Define the business problem
- Understand the organization culture pyramid
- Assess the level of culture

Step 2: Data Gathering

- Interview those involved in collaboration across levels, functions and divisions in the organization
- Collect and study internal publications, memos and executive speeches which focus on collaboration
- Gather data on current rewards or recognition programs which focus on collaboration

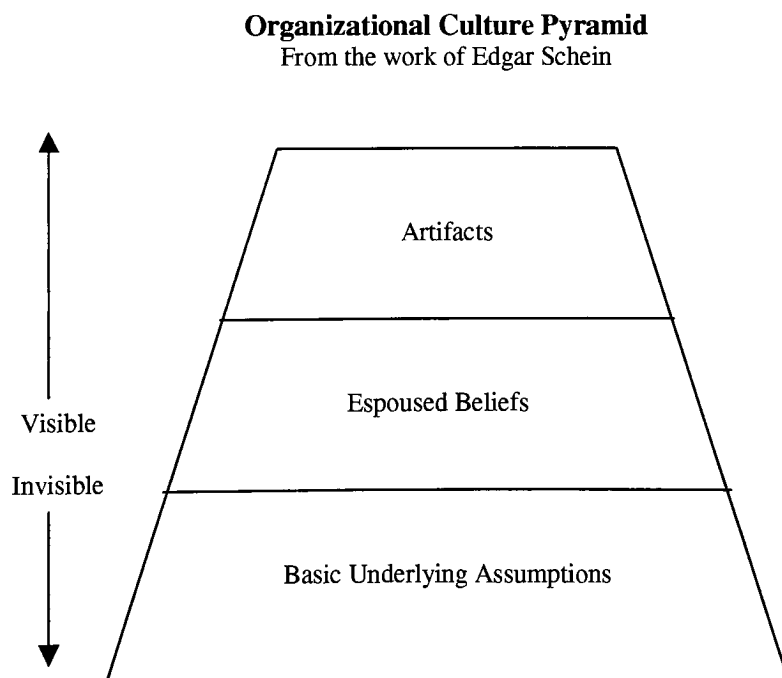
Step 3: Analysis

- Determine the strengths and weaknesses of the organization's collaborative capability
- Uncover tacit models of collaboration currently being used

Step 4: Capability Building

- Diffusing collaborative capability throughout the organization
- Training in boundary-spanning skills
- Creating a collaborative organizational climate
- Building learning networks with other organizations on collaboration

Step 1: Culture Exercise



The purpose of this exercise is to get an understanding of the organizational culture pyramid. The pyramid shows three aspects of organizational culture:

The artifacts - which are the visible aspects such as the buildings, the furniture, the offices, the way people dress and talk, the marketing literature, the annual report, the popular buzzwords, logos and slogans etc. This level is very easy to identify, but it is very difficult to understand what the artifacts actually signify within the culture.

The espoused beliefs of the organization - these are usually visible in the mission and/or vision statements, executive speeches, organizational philosophy, company goals, customer service policies and human resource policies. This level corresponds most often corresponds with what people say, but not always with what they really do.

The basic underlying assumptions of the organization - this is the third and most invisible level of the organization. Most often these are difficult to know even for the members who're supposed to define and enforce the organizational culture itself. These assumptions frequently determine what the organization actually *does*. Frequent conflicts between the espoused beliefs and the basic underlying assumptions of an organization are not uncommon.

In order to clarify the cultural roadblocks to collaboration and the business issues being addressed, the following exercise derived from *Corporate Culture Survival Guide*, by Edgar Schein can be tried with your group of colleagues. A facilitator with knowledge of the principles of culture and group processes may be helpful.

- Identify a list of artifacts, the visible and tangible aspects of your organization's culture, e.g. IBM is often referred to as the Big Blue
- Identify a list of the espoused values of the organization and attempt to link the values with the artifacts paying attention to the inconsistencies between, for example, teamwork (an espoused value) and rewards that focus on individual achievement (an artifact)

- **Conclusions:** This is where you will start to get a clear picture of how culture shapes individual and group behaviors. This process will enable you see how underlying shared assumptions are formed. The final step is to review the shared assumptions and themes and to see how they aid or prevent you from resolving or improving business issues you agreed on at the beginning of the session. As a result, the group may decide on a plan of action to address aspects of the culture that are obstacles to improvement

(Schein, The corporate culture survival guide)

Step 2: Data Gathering

It is extremely helpful to conduct interviews of people involved in collaboration across levels, functions and divisions in the organization to gather information on how the organization deals with and thinks about collaboration. The best way to find the "right people" to interview is to search broadly in the organization for those people who have been involved in multiple collaborations of various types such as joint technical development agreements, industry-government consortia, partnerships, joint ventures, joint branding/marketing agreements, key customer accounts etc. (Digenti, The Collaborative Learning Guidebook, p. 14 -15). The author Digenti suggests that the following guidelines might be helpful in composing an accurate picture of how the organization deals with collaborations (Digenti, The Collaborative Learning Guidebook, p. 15):

Guidelines to assess how organizations deal with collaborative learning
<ul style="list-style-type: none"> • Combine the interview data with a review of internal publications, memos and executive speeches that focus on collaboration. • See if there are significant gaps between how the organization <i>talks</i> about collaboration (the espoused beliefs) versus what <i>really</i> happens in the course of various collaborations (the core values). • Investigate how knowledge and values concerning collaboration are being transferred across the organization through formal training and development efforts. • Investigate if there is a system of rewards or recognition programs that focus on collaboration in the organization. <ul style="list-style-type: none"> • Is there a lot of talk about teamwork, but no team-based reward system? • How do people rise in the organizational hierarchy?

- Are senior leaders veterans of numerous successful collaborations or are they brilliant technologists or financial deal-makers?

Step 3: Analysis

Once the Data gathering is complete, it's time to transform that data into information. The best way to determine the state of collaboration in the organization is to review the data and determine what the enablers and barriers to collaboration in the organization are. This can be done through a review of the statements of the interviewees, the documents and other material. Hopefully, by this point some common and overarching themes and patterns would begin to emerge: "we never follow through," "partners don't perceive us as friendly," business folks don't have a clue about the development environment," "marketing seems to have an uncanny ability to dictate unrealistic schedules that we are doomed to miss." It is important to take this analysis back to those that provided the data and ask for their feedback on your interpretation.

Author Digenti lists the following list of barriers and enablers compiled from a list of cross-organizational assessment (Digenti, The Collaborative Learning Guidebook, p. 16):

Barriers to Collaboration

- Lack of vulnerability
- Lack of trust and openness
- Defensiveness
- Low self-esteem
- Socialization - the paradigms we live with concerning collaboration
- Lack of rewards
- "Teamitis" - too much talk about teamwork and no follow-through
- Fear
- Credibility gap - if the new approach comes from an internal source, it is suspect; if it is introduced from external sources (e.g. pricey consultants), it is assumed to be more valid
- Corporate structures
- Personalities - "blankets": people I get along with versus "sandpaper": people

who rub me the wrong way

- Hierarchy
- The need to win - get the promotion (as an individual)
- Competition internally and externally
- Legal issues
- NIH (not invented here) syndrome

Enablers to Collaboration

- Clear vision and objectives
- Mutual gain
- Social interaction
- Having passion
- Natural desire to connect
- Positive energy and "flow"
- Understanding and valuing the individuals one is working with

Step 4: Capability Building

Once the managers or change agents attain a clear and fundamental understanding of the state of collaborative learning in the organization, they can take the initiative to create guidelines, processes and support systems for the creation of an organizational climate that supports collaborative learning. The Collaborative Learning Network formed by a consortium of major US Corporations such as 3M, Kodak, Shell, Hauser etc. has identified the following factors that facilitate the building of the collaborative capability in an organization (Digenti, The Collaborative Learning Guidebook, p. 17):

Factor that Build Collaborative Capability

- A broad learning strategy derived from your own experience, from contractors, suppliers, partners and customers; learn from companies outside your business and leverage it by replicating it throughout the company without reinventing the wheel
- Creating the potential for a stream of opportunities

- Comfortable personal relationships between top executives
- Collaborative success based on self-knowledge, chemistry, compatibility
- Specific collaborative forums to exchange learning
- Creating a robust meta-language between partners through linkages and network of practitioners where the community's subjective viewpoint is shared and the partners begin to speak a common language
- The use of common platforms e.g. Email, virtual meeting software, the Internet
- Face to face meetings at multiple levels of the partner's organizations -- building history of meetings builds trust
- Approaching opportunities with humility
- Sharing long-term plans between partners
- Encouraging peer learning

The formation of an internal group focused on collaboration is essential to diffusing collaborative capability throughout the organization. According to Digenti, "this group from various divisions and levels in the company, champions collaboration for the organization, and experiments with practices that support collaboration processes" (Digenti, The Collaborative Learning Guidebook, p. 17). Also, this group builds its own abilities in Boundary-Spanning skills. Once the internal group has established some competency in boundary spanning, efforts to build a learning network with outside partners can begin to take shape.

4.2 The Capabilities Capability Assessment Questionnaire

The following form is a variations derived from the work undertaken by the Collaborative Learning Network that can be used for the collaborative capability assessment (Digenti, The Collaborative Learning Guidebook, p. 18-19):

The Collaborative Capability Assessment Questionnaire

This assessment is intended to create organizational knowledge about internal and external collaborative capability. The following questions provide the structure for one-on-one interviews, as this method will be the most effective in eliciting the required

information. This information will form the foundation for enhancement of both collaborative processes and boundary-spanning competencies. We thank you for your assistance in participating in this assessment.

Name (optional) _____

Organization _____

Title/Dept. or Div. _____

Date of Interview _____ Interviewer _____

Part 1: Internal Collaboration

Give one example of a collaborative effort of a significant complexity that you have been involved with internally. Who were the players? What was the nature and duration of the collaboration?

What were the key success variables in the collaboration?

What were the key shortcomings in the collaboration?

What resources/tools would have helped to make the collaboration more successful?

What were the skills that were most helpful in making the collaboration successful?

Did any of the members receive formal training in these skills?

-Yes -No

If so, what was the training and where did it take place?

How did the collaborators communicate, and what worked best?

What is the one most important factor in improving internal collaboration capability?

Can you recount an incident or story that highlights some of the successes that the collaboration experienced?

Part 2: External Collaboration

Give one example of a collaborative effort of a significant complexity that you have been involved with externally. Who were the players? What was the nature and duration of the

collaboration?

What were the key success variables in the collaboration?

What were the key shortcomings in the collaboration?

What resources would have helped to make the collaboration more successful?

What were the skills that were most helpful in making the collaboration successful?

Did any of the members receive formal training in these skills?

-Yes

-No

If so, what was the training and where did it take place?

How did the collaborators communicate, and what worked best?

What is the one most important factor in improving external collaboration capability?

Can you recount an incident or story that highlights some of the successes that the collaboration experienced?

Part 3: Resources

Are you aware of any internal resources for the support of collaborative efforts? This might include manuals, websites, databases, experts etc.

How could these resources be made more useful?

Would it assist your external collaborative efforts to know who else has worked with that external organization, and in what capacity? - Yes -No

If yes, how should that information be offered (database, directory, website, Lotus Notes, LiveLink, Artemis, other)?

Are you aware of any mentoring programs that focus on collaboration? If so, describe them.

In your current collaborations, do team members engage in job rotation with other divisions or organizations?

Chapter 5.0

Boundary-Spanning Skills

5.1 The Need for Boundary-Spanning Skills

In the rapidly evolving, technology driven business environment of the day, managers and change agents are now compelled to work in multiple boundary-spanning situations:

- Internal to the organization, managers must address functional, national culture and subculture boundaries within a single project team given the diverse, international character of the white-collar work force these days.
- Customers and suppliers have increasingly become parties to product and market decisions, and so managers must be able to bring external perspectives to their own organizations and be sure that internal barriers to fulfilling customer needs are addressed in a timely manner (Senge)

In the past, the management of functional boundaries (project managers), national cultural boundaries (international division managers), and sub-cultures (the "people" persons of the company) were well-delineated, separate roles; now contemporary managers must handle all these roles simultaneously. This need is addressed by a set of cross-disciplinary boundary-spanning skills. The new business environment presents radical new challenges and opportunities (Digenti, Toward an understanding of the learning community):

New Business Environment: Radical Challenges and Opportunities
<ul style="list-style-type: none">• There is increasing market pressure for reducing cycle time and increasing technological innovation• The advent of new computer mediated communication (CMC) technologies and groupware has made "funneling" and control of information an anachronism• Several cultures, especially in emerging markets of Asia and Latin America, work on a more densely networked model than the U.S. and expect relationship building at all levels of the company• Direct multilevel linkages and channels of interaction with customers and other

companies can lead to: more rapid innovation, more accurate problem solving, faster service and customer service competency enhancement

For such multilevel, multichannel linkages between collaborators to succeed, all parties to the collaboration need to possess boundary-spanning skills. The project teams need to identify their counterparts in the partner organization and create opportunities for multilevel relationship building in the context of the joint ventures. (Digenti, The Collaborative Learning Handbook, p. 22).

5.2 The Six Boundary-Spanning Skills

The Boundary-spanning skills combine organizational learning, intercultural, and negotiation/mediation approaches to provide managers and change agents with the systematic competency to address multiple boundary situations and to create as well as manage knowledge gained through these interactions. The boundary-spanning skills are (Digenti, The Collaborative Learning Handbook, p. 23):

Core Boundary-Spanning Skills
<ul style="list-style-type: none">• Double-loop learning• Communications (dialogue, feedback, listening)• Mediation/negotiation• Systems Thinking• Peer Learning• Intercultural competency

Double-loop Learning: The usual approach to a new experience or piece of data is called single-loop or adaptive learning. When we're confronted with a new experience or piece of information, we automatically alter our behavior or reactions accordingly without questioning our assumptions and beliefs concerning the experience or data.

Double loop or generative learning occurs when we encounter new data, change our behaviors and actions, with the additional process of investigating our assumptions and beliefs, learning and generalizing based on that investigation, and creating new behaviors (Digenti, The Collaborative Learning Handbook, p.23). Noble Laureate and Poet Octavio Paz had rightly stated that *Perception is conception*. Developing skills in double-loop learning ability involves putting the spotlight on what constitutes and drives

our perception. We need to increase the awareness of the filters and assumptions we use in interpreting and/or constructing reality. Mechanisms for increasing this awareness are developed through the second boundary-spanning skill: **communication**

Communications (dialog, feedback, listening): The word "Communication" comes from the Latin "Communicatio". It's meaning(s) and etymology has an interesting history: "community," "commune," "communion," "confluence", "That which is communicated or imparted", "Interlocution," "Giving," "Friendship," "Worship," "Rite," "A trope, by which a speaker assumes that his hearer is a partner in his sentiments, and says we, instead of I or you". In modern times however, the word communication has ceased to be any of the above and that's where the core of the problem lies. The ability to hear, understand and empathize through listening is perhaps the most essential component in any human communication. While the term "communication" might have become hackneyed and overused in the corporate world, the actual act of human communication is an extremely difficult process to understand and practice.

Human Communication: Difficulties and Challenges

- Hearing others is a necessary but not sufficient condition for true communication to take place; one needs to hear oneself to uncover hidden biases
- Methods to improve listening ability include the practice of *dialog*, first codified by physicist David Bohm. Dialog is a technique that allows divergent communication to take place, i.e. communication that does not drive to a given conclusion or agreement. Dialog not only allows us to listen to others, it facilitates our understanding of how language is used and signified, without judgment (Digenti, The Collaborative Learning Handbook, p.23). For example, when a Japanese IT manager of SolarSoft calls from the Tokyo office telling his counterparts in the headquarters in the Silicon Valley that they "*require* that their server systems located in Tokyo be set to local time" what it really means is that they *prefer* that their server systems be set in local time.
- The third component of boundary-spanning communication is the ability to give and receive **feedback**. This challenging skill helps us in both seeing our filters on reality and improving our communication ability. Feedback is always directed at the impact on oneself of another person's behavior. It is a technique that allows potentially e.g.-damaging data to be given in a neutral and helpful way (Digenti,

Mediation/negotiation: Increasingly, organizations continue to evolve towards more democratized, flattened hierarchies, moving away from the *command and control* management techniques of the past. This has created a greater need for peer-influencing skills in an environment where almost nobody is more equal than others. Mediation and negotiation capabilities allow parties to develop alignment through a focus on shared interests. "This focus on mutual self-interest, on finding common ground and building on it, is a move away from political maneuvering and a winner-take-all approach to management and collaboration (Digenti, The Collaborative Learning Handbook, p.23)."

Systems Thinking: System thinking provides the essential backdrop for understanding cause and effect relationships between the organizations and the larger environment in which they operate. It gives a holistic perspective of things and issues rather than their discrete parts only (Brown). By understanding the systems thinking perspective and archetypes, the potential for identifying barriers and building new connections is greatly increased

Peer Learning: Peer-to-peer learning is a vital and perhaps in many cases the most effective form of learning between organizations. The increasing pace of technological change, and along with it the complexity of interactions and networks with which the business professional must deal, there is going to be an increasing need for online learning -- learning that is focused on business practice and problem solving.

Peer-To-Peer Learning Networks: Faster, Nimbler and Better

- In current business practice, there isn't enough time for the accumulation of data, hypothesizing, testing, development of theory and then application of theory to case studies. Hence, the need to make online learning visible, with theory and practice developed in parallel and involving all players in problem-solving activities (Digenti, The Collaborative Learning Handbook, p.24). This would empower employees to generate bottom-up solutions and lead to greater innovation.

- The wide availability of inexpensive, sophisticated and highly effective computer mediated communication (CMC) tools, the movement for self-directed work teams, 360 degree feedback, and the widespread proliferation of communities of practice all support the increasing relevance of peer-to-peer learning structures

Intercultural Relations: Some of the commonly known driving factors that ensure success in an intercultural setting include flexibility, openness, sensitivity, tolerance, curiosity, ability to handle stress, a sense of humor and so on. But inspite of these skills the resurgence of one's native cultural values and that they are "right" can happen quite unexpectedly. To overcome such subtle and invisible barriers, there must be a high commitment to learning about other cultures along with a consistent dose of humility. (O'Hara-Devereaux and Johansen)

- We can never know all with reference to another culture or the biases of our own culture
- The awareness of other cultures must be based on interaction with members of that culture; it cannot be acquired from books and lectures no matter how engaging or insightful they might be

Boundary-spanning Skills Competency Model

(Digenti, The Collaborative Learning Handbook, p.25)

Competency 1: Double-loop learning

An employee with a high double-loop learning competency has:

- Understanding and demonstrated ability for assumption-checking
- Ability to show others the reasoning behind a course of action
- Ability to reflect, summarize and transmit learning from collaborative activities
- Fluency with IT tools which support double-loop learning

Competency 2: Communications

An employee with a high communications competency has:

- Well written, articulate, timely, result-oriented communications with stakeholders
- Ability in active listening
- Knowledge and regular practice of dialog skills
- Knowledge and regular practice of giving and receiving feedback
- Ability to express empathy, concern and appreciation

Boundary-spanning Skills Competency Model
(Digenti, *The Collaborative Learning Handbook*, p.25)

Competency 3: Mediation/negotiation

An employee with a high competency in negotiation/conflict management has:

- Ability to negotiate issues based on their merits, not on the positions of individuals
- Understanding of mutual gains of parties
- Ability to seek results that are based on fair standards of measurement
- Understanding of risk tolerance and one's authority to negotiate
- Fluency with conflict management approaches and outcomes

Competency 4: Systems Thinking

An employee with a high competency in systems thinking has:

- Understanding of company's business, strategies and vision
- Ability to articulate and apply company's vision and strategy to individual, group and division actions
- Knowledge of external factors -- markets, industries and leaders -- that impact company's business
- Ability to analyze the cause and effect relationships in activities through causal loop method
- Experience and skill with problem-solving approaches

Competency 5: Peer Learning

An employee with a high competency in mentoring/peer learning has:

- Ability and interest to seek out informal learning opportunities
- Desire to transmit learning and share broadly with others
- Active networks which support ongoing learning and relationship-building
- Ability to create direction and opportunity for others
- Alignment of personal goals with learning opportunities

Competency 6: Intercultural Competency

An employee with a high competency in intercultural interactions has:

- Ability to be open, flexible, tolerant and non-judgmental
- Knowledge and practice of stress management techniques
- Understanding of own cultural "filters" and how they impact behavior
- Virtual meeting skills and experience

Boundary-spanning Skills Competency Model
(Digenti, The Collaborative Learning Handbook, p.25)

- Ability to support shared norms based on business needs
- Understanding of diversity dimensions and level of system

Chapter 6.0

Collaborative Learning Group Methods

6.1 The Parallel Learning Group

According to author Dori Digenti "parallel learning groups are created to open new channels of communication outside and parallel to the normal, hierarchical structure of each organization" (Digenti, The Collaborative Learning Handbook, p. 29). Such groups should cut across organizational lines horizontally and vertically, define their own boundaries and strategies, and bring new thinking and creative energy to problems that have challenged normal decision making processes. For such learning groups to be effective participation should be voluntary.

The parallel learning group should be composed of a diverse group of individuals, from different divisions/functions, generations and cultural/national backgrounds within the organization. This is critical to avoid replicating the usual patterns and bureaucratic behaviors of the organization and to ensure that unheard voices within the organization are heard. (Busche and Shani)

6.2 The Study Group

The idea of Study Groups originated in the Japanese corporations. "According to a recent survey, 83 percent of large companies in Japan utilize internal study groups and 59 percent of managers report satisfaction with study group results" (Digenti, The Collaborative Learning Handbook, p. 30). Such study groups in Japan have typically included no-error movements, mini think tanks, suggestion groups, safety groups, zero defect movements, workshop involvement movements, productivity committees, management by objectives group etc.

A general format for study group process could typically include:

- Members/team study the same topic and share findings

- Members/teams each study a different topic and exchange findings
- Members/teams meet to discuss their firm's processes and exchange practices
- Members/teams meet with an external organization to study its processes and discuss applications to their own firms

The study group has a twin purpose: to learn about the topic chosen for study and simultaneously develop the member's abilities to work and learn collaboratively. Much of the learning and information gathering in such a group takes place informally. (Digenti, Zen learning: A new approach to creating multiskilled workers)

6.3 The Leader's Circle

Leader's circles typically focus on personal development through peer learning, mentoring and counseling on problem-solving activities. The leader's circle meets monthly and each member is allowed 20-30 minutes to present a problem or issue to which they receive highly focused feedback, questioning, support and relevant information. Each member decides on a goal to work and commits to implement the advice given in the circle before the next meeting and report on changes that occur as a result. (Marshall)

6.4 Reciprocal Teaching Group

This method of group learning is based on the principle of distributed expertise and peer learning and teaching. The reciprocal teaching method centers on the formation of small research groups, each being responsible for investigating a subset of knowledge within a larger field of inquiry. Once the investigation is completed and research compiled, the whole group convenes for jigsawing. Jigsawing involves the formation of new small groups, where each group is composed of one member from each research team. The new teams report on their findings to representatives from the other research teams and the jigsawing process continues iteratively until every member of the whole group has learned from each research team. (Rough)

6.5 The Wisdom Council

A Wisdom council consists of twelve to twenty-four people who are randomly selected to come together as a temporary learning system with the purpose of

determining the pulse of organization as a whole. It acts as a subset of the whole to determine what the key issues, challenges, obstacles or needed changes are in the organization and come to a consensus much like the member of a jury. The participants can come from any level or job function in the organization. The Wisdom council represents for the organization a structured, time-bound period of unhindered reflection with the express aim of creating and announcing a unanimous, non-binding statement that articulates the informed wisdom of the people in the organization. (Digenti, The Collaborative Learning Handbook, p. 32)

6.6 Rotation Teams

Rotation teams are extremely useful in rapidly building collaborative knowledge and trust in a new partnership, joint ventures or mergers as well. The method involves developing a team from each partner, each member of which will rotate through the partner organization, working with the partner's team and learning the internal practices of the partner. Each team member is expected to spend 2-4 weeks on-site with the partner and is immediately followed by their next team member in the rotation much like a relay race in which the entire team participates. At regular intervals and especially at the end of a complete rotation, the two teams come together to compare notes internally and share learning across the partner organization. The whole process should take no more than 2-6 months; thus leading to a strong internal knowledge and rapid relationship building. (Rough)

Chapter 7

Forming a Learning Network

7.1 What is a Learning Network?

"A learning network is a group of organizations that come together for collaborative learning resulting in behavioral change that creates value for each organization (Digenti, The Collaborative Learning Handbook, p. 35)". Constant change, shifting market dynamics and technological disruption makes it extremely important to manage and monitor environmental dependencies constantly. The firms can build seamlessly integrated and highly efficient supply-chains only by understanding and creating strong linkages with customers, suppliers, distributors, regulators and others who impact their business on a real-time basis. Creation of a learning network can facilitate dense linkages with these parties. One of the positive side-effect of this is the a learning network brings an external perspective to the organization and helps illuminate blind spots and provide useful external feedback to the organization. The creation of a learning network is focused on boundary work (Digenti, The Collaborative Learning Handbook, p. 35):

Formation of a Learning Network involves:
<ul style="list-style-type: none">• Creating boundaries that facilitate useful collaborations to take place between emergent or potential systems• Spanning "hard" boundaries to allow collaborative work -- across company divisions, between firms or among groups of organizations with shared interests or needs• The goal of the learning network is to move beyond "data exchange", the transactions based sharing of company information, to continuous interactions where new knowledge is co-created

A learning network begins with the sharing of the common goals among the members and the formation of an internal learning group that engages in and experiments with agreed upon goals, peer learning and teaching activities. “The network then meets to share what they have learned internally in their home organizations and actions they’ve implemented based on their investigations. They also commit to mutual problem solving activities on a regular basis.” Some of the advantages of this format for meeting across organizations are (Digenti, The Collaborative Learning Handbook, p. 36):

Advantages of the Learning Network Activities
<ul style="list-style-type: none"> • It moves the shared dialog beyond data exchange and into the realm of experimentation and implementation, ensuring double-loop learning • It utilizes collaborative learning methods • It requires commitment by the member organizations • It leads to capabilities in sustaining and diffusing knowledge

7.2 Step for Forming a Learning Network

The plan presented below is a general blueprint for building a learning network that must gradually evolve its structure through mutual practice, agreement, discussion and experimentation by the members. (Schein, Building the learning network)

7.2.1 Form the internal groups

Forming a Learning Network: Initial Activities
<ul style="list-style-type: none"> • Cultural and collaboration assessments • Build boundary-spanning competencies internally • Create internal mission and goals

The formation of the internal groups can either precede the formal entry into the learning network or can result from initial meetings with potential consortium members or a pre-existing learning network. The internal group needs to engage in a process of thoroughly understanding its own organizational culture and sharing mental models of that culture with each other as described in preceding chapters.

7.2.2 Form the network

- Determine a purpose
- Define the membership
- Make contact
- Exchange information

At this stage the initial shape, size and depth of the learning network is conceptualized. The purpose or the organizing principle of the learning network will be proposed by either the lead organization or the network facilitator who is forming the learning network (Digenti, The Collaborative Learning Handbook, p. 37).

Chances are that the vision, mission and values of the learning network will undergo several iterations as the learning network evolves. Once the proposed memberships is in place the lead organization or facilitator will need to make contact with the proposed members. Author Digenti suggests a set of important guidelines if the learning networks that involve large organizations: (Digenti, The Collaborative Learning Handbook, p. 38)

Guidelines for Learning Networks with Large Organizations
<ul style="list-style-type: none">• Make contact at the highest possible level in the organizations• Gain endorsements for the consortium concept from well-known authorities or high level executives• Devise a crisp and business case-oriented executive summary of the explicit and implicit goals as well as potential beneficial outcomes of the learning network• Allow for adequate time to attain buy-in and receive responses• Be steadily persistent in pursuing responses from the proposed member organizations and firms• Once contacts are established, an initial one-on-one meeting between learning network facilitator and each company will help to determine what the proposed members might learn and contribute to the effort

7.2.3 Create the network structure

- The convocation meeting
- Build network mission/goals
- Decide structure and duration

The convocation meeting of the learning network members lays the framework for building common ground through the creation of vision, mission, values and goals for the group. It is important to keep the mission definition as narrow and as focused as possible. It is useful to decide the duration of the learning network at the outset. This could be for example, one-year initial cycle of work followed by an evaluation and possible extension with or without re-structuring if the activity continues to meet the needs of the members (Digenti, *The Collaborative Learning Handbook*, p. 38).

7.2.4 Build common ground

- Engage in boundary-spanning skills
- Form dense networks (conduits)

After the convocation meeting, each internal group works on its collaborative assessment while simultaneously the learning network becomes fully operational. At this stage it is critical to have agreements on technology platforms for the development of the learning network. The use of conferencing software and Extranets are important elements for as the consortium develops.

Building Common Ground: Activities and Benefits
<ul style="list-style-type: none">• A cross-organizational Technology study group may be created to further networks and engage in boundary-spanning activities• The formation of dense networks or conduits for the growth of the learning network is crucial• Leverage pre-existing relationships in the consortium e.g., customer/supplier, tech partners etc. to further the process of building interdependency by discovering and mapping the existing relationships between the companies• The relationship will be strongest between firms who solve problems together, share outcomes and take the risk to question existing assumptions

- Mutual assessment centered around "closed -loop" activities between the members of the learning network for projects that complete all stages of work including implementation, measures, evaluation, feedback and dissemination of learned summaries, will feed the high levels of trust and mutual commitment (Digenti, The Collaborative Learning Handbook, p. 40).

7.2.5 Engage in collaborative learning

- Create and execute programs
- Share resources
- Capture and transfer learning

This phase drives the transition to value creation activities for the learning network. Projects can take forms as varied as research to standards activities, experimentation, problem-solving or peer teaching seminars. The ongoing input and support of internal groups is central at this stage to effectively capture and transfer the learning from the inter-company networks program.

7.2.6 Evaluate and sustain the network

- Review the business measures
- Evaluate the process and make adjustments
- Reinforce rewards and incentives

One of the most important aspects of value creation for the learning network must be effective business outcomes or measures (Digenti, The Collaborative Learning Handbook, p. 40):

Evaluating the Effectiveness of the Learning Network

An effective evaluating will seek to answer the following questions:

- How much the company has saved through sharing of resources?
- What has been the bottom-line impact of new sources of learning?
- Are there specific technology applications that might have emerged from the network activities that are now producing profits or cutting operational costs?
- Are the internal groups adequately rewarded to continue profitable network activity?

- Has the senior management of the organization been informed of the learning network activity?
- Has feedback been received and acted upon?

7.2.7 Closing the learning network

- Design closing meeting
- Assemble learning history
- Establish mentors

Each learning network has an implicit or explicit natural life cycle in the minds of each member organization. It is recommended that member organizations have an explicit agreement as to the duration or natural life cycle of the learning network because open-ended groups tend to lose their effectiveness, motivation and focus if stretched over an indefinite period of time. Once the initial contracted period of activity has elapsed, the network members should decide if they would like to re-contract. If not, then a formal closing meeting should be scheduled.

Closing the Learning Network: Evaluation, Celebration and Preservation

- The closing meeting should celebrate the growth and opportunities that arose out of the collaborative work done through the learning network
- Outstanding contributions from individuals and members firms should be recognized and suitably rewarded
- A formal learning history of the learning network should be created
- A core group of mentors from the learning network should be created who would be available for a certain period (say, two years) to mentor others in each organization who may wish to initiate a learning network.
- By combining a written summary and learning history of the group and having a committed body of mentors who "embody" the learning in a fractal like relationship, more effective transfer and dissemination of knowledge can take place

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