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Addressing Organizational Complexity: The Rise of Complexity Theory and Network Analysis

I have talked often in the last year about a common issue facing many of our clients – rapidly increasing complexity and scale, often associated with increasing risk. Whether you are a global enterprise or a knowledge-based non-profit expanding to another city/state/nation, and/or scaling up to provide additional services or deal with additional clients, these issues of complexity affect you.

Two developing of organizing inquiry provide some perspective and fresh thinking about how to deal with the challenges caused by increasing scale, complexity, and risk. One is complexity theory, the other is network analysis.

Complexity Theory:

What are complex organizations?

These organizations typically are characterized by high growth, exponentially growing intricacy, matrixed responsibilities, and often are knowledge intensive and subject to higher degrees of risk. In some respects they are similar to the "fragile process organizations" we have discussed before (see Winter 2003/2004 and Fall 2005 Newsletters), where the core processes involve multiple steps, little slack time, and variability in results, even if the processes involved are supposedly robust and rigorous. Sound familiar?

What are the tensions in these organizations?

Typically these organizations have trouble (inherently because of their size, complexity and growth) with governance, communication, risk assessment, cost and quality standards, and keeping to schedules. They also tend to have trouble with knowledge transfer and application, as well as loss of true dialogue across the organization.

What behaviors do effective complex organizations exhibit?

Here are some of the leadership/management behaviors that appear to be effective in dealing with complexity:

Robust, pervasive dialogue – effective complex organizations do a great deal to encourage connections

across the organization and outside it. They look continuously at ways to improve dialogue across, up/down, and obliquely throughout their organizations. By the way, I use the word "dialogue" deliberately, because we are not talking about one-way communication here, but true dialogue (two-way communication in which more senior leaders and managers do as much "active listening" as they do informing others).

Continuous Learning -- "Learn" has a very broad meaning here. It means not only learning technically, but also *communicating* that learning continuously and relentlessly. This has to start at the top, with the senior leaders and senior leadership team focusing on strengthening communication of all kinds, and on improving "connection" throughout the organization.

Making processes dynamic in response to changes in the organizational environment -- Essentially this means continuously updating processes (like financial reporting, accounts receivable management, customer satisfaction measurement), as opposed to trying to force the environment to conform to the processes (e.g., in customer satisfaction measurement, being sensitive to the ways in which customer satisfaction changes as customer demands change, and adjusting the measurement systems accordingly).

Recognizing that traditional medium and longer-term strategic planning is futile, except as a place from which to start -- This is a controversial proposition, but for most complex organizations, it would be hard to have forecasted accurately what in fact happened over any three year period. It is probably just as hard to do so now, so instead of trying to do so, it typically is better to:

- Focus on those behaviors (embracing change, being flexible, etc.) that will make strategic surprises easier to deal with in the future
- Think in terms of scenarios that might encompass, say, 90% of the planning horizon and preparing for all of them to some degree
- Abandon for the most part strategic planning driven by data, and instead apply intense intellectual effort to solving the "mystery" (to use Malcom Gladwell's great phrase) that the fu-

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ture creates
Coach (rather than "supervise") knowledge workers
– The positive side of this is, once a leader feels comfortable in both the ownership and judgment of his subordinates, hopefully he/she can focus less on supervision, and more on helping others improve their effectiveness.

This does *not* mean that senior managers shouldn't have an intimate understanding of the current issues (and future issues) that can destroy the organization's effectiveness. The behaviors underpinning this notion (again, judgment and ownership) are, of the behaviors discussed here, for me absolutely the most important in creating and maintaining a high-performing complex organization. It helps enormously if there is a significant reservoir of ownership focus throughout the organization. If not, it needs to be built, for it is a prerequisite to success in managing knowledge workers.

Role of Technology

You will note that technology is never mentioned above. It is not that technology cannot be an enabler which facilitates some of the above behaviors and desired results. But technology is virtually never a solution in and of itself. A good example is found in the notion of knowledge management: There are virtually no examples of where sophisticated "knowledge databases" on their own create the desired spread of knowledge. It takes the requisite connective behaviors (ownership, curiosity, proactivity, ability to connect with others at some level, among others) to make knowledge management work.

Network Analysis:

"We didn't connect the dots." This is probably the defining phrase in all of the analyses done of the 9/11 calamity. That event also brought attention to one tool which allows us to better "connect the dots" in virtually any setting. That tool is *network analysis*.

What is Network Analysis and what can it DO?

The term "network analysis" now covers everything from evaluating so-called "communities of interest" to trying to figure out who the most important players in Al-Qaeda are, based on telephone (and other) records. Essentially, it is the science of using connections among people to help understand:

- Who are the "answer people," who are the "discussion people" regardless of topic, who are the "question askers"
- Who is "in" and who is "out" of the loop
- Who may be overworked/underworked, and why
- Who are the real decision makers and where

Complexity theory and network analysis are two newer tools that both help address an age-old management question of management: "Once I have more than one stakeholder evaluating my performance or my group or division's performance, how do I best manage the complexity that results?" For a long time, matrix management was virtually the only tool available. Now new approaches, offering new perspectives, can help both enrich matrix management, and in some cases, suggest entirely different pathways to making a complex organization more effective.

does decision-making reside

Ultimately, it is about helping either make such networks stronger and/or more useful, or at the other extreme, to destroy them completely.

Where can it be applied?

Here are some examples of where network analysis may be useful in a positive manner:

Case #1: A complex, rapidly growing, heavily knowledge dependent manufacturing site is attempting to strengthen its governance processes, thereby creating a higher reliability of supply and a more robust infrastructure. By using one tool of network analysis, the sociogram, one can ascertain who has the most influence in what parts of this organization, who is relied on to provide institutional knowledge, who is critical for plant operations, and who might be the best at helping others develop institutional knowledge, improve judgment, and communicate more effectively.

With regard to the latter, communities of interest reside in any organization. In this case, they flourish already around manufacturing approaches, process improvement, and employee management. By understanding where they exist and who populates them, network analysis can help the organization strengthen them and better align them in the organization's best interest.

Case #2: A rapidly growing aerospace and defense contractor manages large, multi-year contracts for the federal government. In attempting to successfully recompute for these contracts, it is faced with the classic "customer stack" for any individual program. That stack of customers includes Program Officers, Government Contracting Officers, managers, senior level civilian and military managers and leaders. Each of these individual customers may have slightly – or widely – differing priorities. Some may be solely interested more in the mission, some more in saving costs, some more in saving jobs. Network analysis can help sort out who is responsible for what part of the contract, who actually has more say in the awarding of such contract in the future, who may not have the ability to say "yes," but definitely has the ability to say "no."

Case #3: A young manager joins a major consulting firm, and is destined to work on a large contract that is ramping up quickly. Just as quickly, she needs to figure who has what responsibilities, both inside the consulting firm, and also within the client. Who are the intellectual thought leaders on both sides? Who are the sole contributors? Who has the administrative clout? Who can cause problems, even if they can't provide answers? These questions and more