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Beyond Traditional Systems Thinking: Resilience as a Strategy for Security and Sustainability

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Abstract

Systems thought has helped managers anticipate prevent or protect against potential crises, but the modern world also requires resilience, a generalized capacity to cope and act without knowing in advance what one will be called to act upon. Resilience is particularly important strategy for innovative, unique, and transformational organizations that take on inherently unpredictable missions. This paper explains the concept of organizational resilience, and the specific capabilities that allow coping with adversity and the generally unexpected. I relate recent studies and insights from firms that have survived extreme blows, high reliability organizations where the risks from error are extreme, systemic design, research on individual resilience identifying the attitudes that help overcome adversity, and an incipient system dynamics model. I conclude by showing how the skills and strategies of resilience can reconcile society's need secure safety with the equally compelling need for innovation, exploration, and transformation.

Beyond Traditional Systems Thinking: Resilience as a Strategy for Security and Sustainability

Systems thinking has long been a primary source of guidance in crisis management. Ian Mitroff and his students and associates are among the most highly regarded thinkers in the field. Work such as Mitroff & Kilmann (1984), Pauchant & Mitroff (1992), Mitroff & Anagnos (1996), and Mitroff, et al. (2001) has provided incalculable savings by helping managers systematically consider the potential crises their organizations face, and how they might prevent or protect against them.

Yet however valuable these tools of systemic planning and anticipation, they are insufficient to provide security and sustainability in an unpredictable, highly interconnected, rapidly changing modern world. To cope with events that cannot be anticipated or planned for, a small but growing number of academics, consultants and managers have been trying to understand and develop ***resilience***, a generalized capacity to cope and act without knowing in advance what one will be called to act upon. Any balanced approach to securing safety will incorporate strategies of both anticipation and resilience, but in today's world, resilience is usually the more important and efficacious of the two.

The Concept of Organizational Resilience

Of course, it's desirable to anticipate and avert crises whenever possible, but anticipation can be effective only in situations where (1) we know with high probability the worst risks we face and (2) we can apply that knowledge to avoid or mitigate negative outcomes. For most organizations, neither condition applies.

The worst risks that organizations face usually turn out to be surprises: Arthur Anderson was brought down by shredded papers; Enron and others were destroyed by the complicated transactions that originally generated great wealth. Firms in New York's World Trade Center were decimated on September 11th 2001 by attacks that were not fathomed even by national security agents who in retrospect had good reason to suspect them.

Even when organizations are accurately apprised of risks, knowledge often fails to guide policy. For example, Hollings' (1979) study of forestry firm decisions regarding spraying for budworm. Experts at the time uniformly recommended spraying based on a tree-stress index, but usage data over 20 years showed no correlation at all between the index and actual spraying. Rather, decisions on how much spraying (if any) was used were made based on individual attitudes towards budworms (some decision-makers just loath them), external negotiations (e.g. for government assistance), and annual budgets.

Organizations have notorious difficulty developing effective policy even for *inevitable* threats such as the need for innovation (Christensen 2004) and leadership succession (Khurana 2002).

Anticipation is especially problematic for organizations that are innovative, unique, or boldly set out to transform themselves or their environments. Anything never before done could conceivably be *undone* by a vast array of hypothetical low probability risks. To try to anticipate, prepare, and plan for all of them would be doom any mission; organizations that attempt to systematically anticipate all risks may to the detriment of the both the organization and the larger society unduly reject a valuable innovation as too "risky" or reject it *de facto* by never getting beyond the analysis.. Organizations with important missions such as defense or exploration, development of advanced technologies, and those undertaking wide-scale reform, are the least likely to move forward, given the *potential* impact of a *potential* hazard.

Possibility of loss or disaster need not doom a project with important potential benefits. To protect against the almost infinite number and variety of hypothetical hazards that could conceivably go wrong, innovators need not develop hundreds of scenarios and plans. Rather, security can be obtained by adopting strategies of resilience and developing corresponding capabilities.

Resilience can allow an organization to survive, and sometimes thrive, even when unpredicted adverse events occur. Recent work has identified six characteristics that allow organizations to adapt successfully to the unexpected:

- **Strong core values** and a **central purpose** that motivate a community to rebuild rapidly
- **Psychological containment** systems to prevent grief and anxiety from overwhelming rebuilding efforts
- **Cognitive capabilities** such as an ability to process feedback quickly
- **Organic structural** characteristics such as replicative abilities, distributed authority, and decentralized structures with redundant nodes
- **Attitudes of resilience** such as *self-responsibility* to assume one's own place in the world, rather than to let others dictate it (being proactive allows one to accept the new conditions and move forward effectively)
- **Slack resources** -- money, social capital, and leadership reserves -- that can be drawn upon in an emergency

Characteristics of Resilient Organizations

Purpose: Sandler O'Neill & Visionary Organizations Built to Last

My work on resilience emerged from a study of the impact of the September 11, 2001 attacks on the world trade center organizations hardest hit. Although we were originally investigating organizational loss, the biggest story to all of us on the research team was the phenomenal recovery of one firm in particular, Sandler O'Neill & Partners, L.P. Despite losing two-thirds of its management committee, 39% of its workforce, and its entire physical plant, within one year the firm had not only recovered, but was doing better than ever. Our analysis (Freeman, Hirschhorn & Maltz 2004; Freeman, Hirschhorn & Maltz 2003) concluded that the primary source of Sandler O'Neill's remarkable post-attack performance was a compelling invocation of moral purpose. This moral purpose propelled resurgence by directly motivating stakeholders, by enabling outside help, and by unleashing extraordinary physical and psychological resources in concert with "the pull of opportunity."

Sandler O'Neill could have dissolved after 9/11. It did not because it had a purpose. Not just the standard purpose of an investment bank (to make money), but a moral purpose: to rebuild for their dead colleagues, to protect and provide for their families; and to fight on the front line of the battle against terrorism, to refuse to allow those who attacked bring them down. Given this moral purpose, they accepted a challenge to rebuild better than ever … and to make money too.

Our findings are consistent with those of Collins & Porras' (1994) six-year study of the world's most successful and enduring firms. They characterized the financially successful, "premier institutions widely admired by their peers" as *visionary* organizations (VOs), different from their peer institutions in their dedication to making a significant impact on the world around them. Collins & Porras identify nine pillars of these "enduring" VOs:

- *Clock building, not time telling*: VOs focus on organization building rather than the success of a single particular idea or project.
- *More than profits*: a refusal to accept trade-offs between making money and quality or making money and doing good. More generally, VOs refuse to accept "the tyranny of the OR" e.g., stability or progress; they strive for both.
- *Preserve the core/Stimulate progress*: VOs hold core values, not "correct" values but rather those that members feel "deep down to their toes". These core values represent less an obstacle to change than a stimulus for progress (so as to ensure survival).
- *Big, hairy audacious goals:* VOs make bold commitments that grab people in the gut, get their juices flowing, and create immense forward momentum.
- *Cult-like cultures*: VOs are not great places to work for everyone. Those who fit, flourish; those who don't are quickly expunged.
- *Try a lot of stuff and keep what works*. Visionary companies go light on strategic plans. They advance by experimentation, trial and error, opportunism, and accident.
- *Homegrown management*: VOs almost never go outside for a new CEO.
- *Good enough never is*. VOs do not focus on beating the competition; they relentlessly ask how to continue to improve.
- *Alignment*: VOs translate their core drives and values into the fabric of the organization – goals, strategy, policies, cultural practices, building layouts, incentive systems, etc … -- everything they do. This alignment creates a set of signals so consistent it's impossible to misinterpret.

In a world where organizations rise and fall like the twisting deck of a ship in a storm, these features (all strikingly characteristic of Sandler O'Neill) have allowed Collins & Porras' leading firms to maintain a successful, steady course decade after decade.

In Freeman, Hirschhorn & Maltz (2004), we characterize purpose as the "why" of resilience, and observe the extraordinary energies unleashed when a sense of moral purpose works in concert with the pull of opportunity. This combination released extraordinary physical and psychological resources at Sandler O'Neill, but even the most powerful "why" needs a "how." Sandler O'Neill's recovery required that they neutralize potentially paralyzing grief and anxiety.

Psychological Containment at Sandler O'Neill

Sandler O'Neill provided extensive, specialized, on-site counseling services, and many opportunities for the expression of grief, but grief and anxiety were also "contained" so that people could do the work of rebuilding. In the aftermath of the 9/11 crisis, followers and would-be followers looked to leadership to ensure a future for the firm and a place for them within that future. Sandler O'Neill leadership quickly allayed doubts about survival through actions that demonstrated commitment and engendered confidence. Leadership assuaged anxieties through actions that demonstrated continuity and engendered identification.

For all the firm's strengths, grief and anxiety could easily have undermined rebuilding efforts. It did not because the firm managed to allow employees to grieve appropriately and express their anxieties without permitting either to consume them. At work, grief and anxiety were contained – using external clinical expertise – so that employees could focus on their work.

Cognitive Capabilities at High Reliability Organizations

Most theory on organizational resilience has focused on cognitive capabilities, behaviors, and resources that promote or inhibit resilience. This work derives, surprisingly, from work with high reliability organizations (HROs), such as nuclear power plants, air traffic control centers, and hospital operating rooms (see especially, Weick & Sutcliffe 2001). Given the risks, one might think that HROs could not afford even remote possibility of error. Indeed, efforts to secure safety in nuclear power plants and other HROs once entailed purely anticipatory strategies – writing highly detailed procedure specification, documenting, and closely monitoring compliance. But Carroll (1998:713) explains how such efforts can be self-defeating:

> … the increased burden of procedures and supervision can be perceived by maintenance employees as mistrust and regimentation. This may result in loss of motivation, blind compliance to procedures that may still be incomplete, malicious compliance when workers know the right thing to do but also know that only rote compliance is safe from disciplinary action, the departure of skilled workers who find more interesting work elsewhere, and, ultimately, more problems.

For the HRO, the ability to predict what *may* happen is less critical than to detect *actual* small problems and react thoughtfully to prevent them from spinning out of control. To promote this

resilience, organizational learning practice utilizes a wide variety of cognitive techniques including *mindfulness* (Langer 1989a, 1989b), *constructive sensemaking* (Weick 1995), *entrepreneurial orientation* (Jelinek & Litterer 1995) and *virtual role systems* (Weick 1993).

Systemic design features: Organic structure

Perrow (2004) has written extensively on structural considerations critical to resilience. In particular, he has argued that *mechanical* systems augment the impact of disasters, whereas *organic* systems mitigate them. By *mechanical*, he means hard-wired, undirectional, efficient, and dedicated (single purpose) connections with hierarchical structures. *Organic* systems, in contrast, contain "web-like characteristics": high redundancy, quick replication, dormant or excessive resources, and decentralized structures with redundant nodes and distributed authority. The ability of Sandler O'Neill to rapidly reconstruct seems attributable in large measure to *organic* systems: workers who could perform, when necessary, the tasks of their colleagues (redundancy); an adaptive ability generated from trust, familiar friends and supporters (dormant resources); and a self-regulating work force (decentralized structures with distributed authority).

Research on individual resilience: Attitudes

Research on individual resilience (Werner 1984, 1985; Garmezy 1991, 1993; Wilkes 2002; Masten & Reed 2002) suggests three important attitudes help overcome adversity:

- *Self-responsibility*: To assume one's own place in the world, rather than let others dictate it. Being proactive allows one to accept the new conditions and move forward effectively.
- *Attitude of excellence*: Those used to pushing themselves will find it easier to give the push needed in a crisis.
- *Other orientation* provides a purpose, encourages help from others, helps one avoid obsessing about one's own problems, and helps organize response.

Each of these attitudes strongly characterizes Sandler O'Neill. An entrepreneurial firm that charted its own course from the beginning, it demands the best from its employees and rewards them commensurately. Most important, however, Sandler O'Neill in the aftermath of 9/11 strongly adopted an *other* orientation. The firm had always been philanthropic, but after 9/11 it redoubled its philanthropic commitment, rebuilding to honor their dead colleagues and to take

care of their families as if they were their own.

Resources

Some organizations such as military units can take a hit, and bounce back even stronger, in large part because society is willing to provide additional resources; the attack may be used to justify larger expenditures. For private firms, the situation often bodes poorly.

In general, organizations do not fare well in response to crises, especially fatal disasters (Erikson 1990, 1994; Shrivastava 1987). When the hard work of change and adaptation would need to be undertaken, the people who would do it are dead, traumatized, or consumed with extraordinary responsibilities. Individual recovery from loss is notoriously slow, painful, and difficult; when the community that would normally provide support in times of distress is also distressed, recovery may be impossible. Erikson (1976) concluded that such "collective trauma," is far worse yet than the substantial sum of these private wounds. Moreover, problems in business tend to amplify through reinforcing feedback loops (Sterman 2000), or, more specifically, vicious circles (Masuch 1984). Rudolph & Repenning (2002) observe a convergent insight in organizational studies: even small problems can become major disasters (Vaughan 1996, Perrow 1999, Weick 1993). A setback can deplete an organization's resources. Creditors, alarmed by a shortage of cash, may be unwilling to risk additional capital. Employees facing the possibility of joblessness may seek work elsewhere. Customers and suppliers worried about continuity of service may seek alternative means to ensure continuity of their own services. Doubt begets more doubt and the firm spirals downward in a doom loop.

Sandler O'Neill not only avoided a rout, but managed to actuate a "virtuous circle" in which effort, opportunity, hope, and motivation created an *upward* spiral of confidence and performance. Still, they needed resources to withstand the initial blow, and to fuel the early recovery. In early stage work, we have identified four categories of resources a firm must maintain adequate reserves, and be able to replenish.

- *Wealth:* Cash, other assets, and ability to produce wealth
- *Systems*: Internal coordination, processes & procedures, technical expertise
- *Human Resources:* People with requisite skills and extra effort to give (workers who are

themselves resilient and non-, ex- or part-time employees who can be tapped for additional service as needed)

- *Network Connections*: the quality of relationships with stakeholders, and the quality of those stakeholders (general good will toward the firm)

Applying and Developing our Understanding of Resilience

An Early Stage of Development

Resilience has become a buzzword of late, but the concept is not well understood. Commentators routinely offer examples of anticipation as evidence kind of resilience. For example, Coutu (2002) writes that "almost all theories of resilience" posit that resilient people and organizations are characterized by three traits, one of which is to anticipate and prepare for the worst. She provides as her example the World Trade Center offices of Morgan Stanley, which had practiced extensive fire drills simulating a deadly crisis. The drills may have helped save employees' lives that day (Morgan Stanley's offices were, unlike Sandler O'Neill's, below the point of impact) hence mitigating the loss – a classic example of anticipation and planning – but there is no evidence that it did anything to subsequently help the firm recover or rebuild.

The distinction is not merely academic. In the aftermath of September 11, organizations invested substantial resources in risk management, the great majority of which has gone towards planning and anticipation: massive security investments and technological precautions (e.g., off-site backup systems) to prepare for specific disasters. But technology and planning played no role in Sandler O'Neill's recovery; rather, the firm's accomplishments are due entirely to the ability to absorb an enormous loss and not only rebuild, but to use their loss to rebuild stronger than ever.

As far as I know the Sandler O'Neil project has been the only empirical study specifically devoted to understanding resilience, and even that was only a case study. It's difficult to generalize findings from a sample size of one, so we're actively seeking out domains and funding to study the process and to try to apply some of these ideas.

Additional Work

Larger Scale Research

Currently, we have a few small grants and outstanding grant proposals to study resilience on a larger scale, for example in the printing industry, which has been suffering a major downturn. Despite the industry challenges and a high bankruptcy rate, some firms are doing extremely well. We're comparing these resilient firms with a matched sample. Another proposal is to study firms that have been able to survive or thrive in economies in turmoil – in Argentina and Bolivia for example.

Modeling Resource Reserves, Depletion and Replenishment

We're also developing a system dynamics models of disaster modeling using a resource reserves/ depletion/ replenishment model could predict survival of firms in various crises. We model organizational reserves at time-zero, the depletive effects of various types of crises, and their ability to replenish these assets in the aftermath of a crisis.

Action Research

We also have a few more focused projects. We've been working with the director of patient safety initiatives at a local hospital They've long been collecting data on "near misses," situations where something went wrong and an accident could have (or did) happen, with the purpose of trying to make improvements in the system that the breach should not happen again. Together with the group, we're taking another perspective on the data: to see what forces prevented a simple error or problem from becoming more serious – with the idea of systematically strengthening these capabilities.

We'll also be working next month with NASA on their Next Generation Launch technology program to incorporate features that facilitate resilience into their organizational design.

Particular Applicability to the Transformational Organization

An excellent example of organizational resilience is the Apollo 13 recovery (Lovell & Kluger 1995), a failed flight suffering an unseen catastrophe that crippled the spaceship in deep outer space. The Houston control room and the astronauts worked together coolly, with systematic

dedication and determination to bring the men back successfully in a lunar landing module not designed, nor even imagined, for such purposes.

Apollo 13 illustrated strong purpose and values; cognitive capabilities; attitudes of self-responsibility, excellence, and other orientation; acknowledgement of loss followed by return to tasks at hand; and the ability to draw on external resources.

The resilience of the Apollo 13 mission was organic, arising directly out of that situation. Unfortunately, the policies of the National Aeronautics and Space Administration do not display the same resilience (Vaughan 1996). Because they have not developed strategies and skills of resilience, NASA as a whole has not systematically handled crises well, and the space program has accordingly suffered dramatic reverses and entered into period of at least partial paralysis.

Although the skills and strategies of resilience are especially useful for innovative, unique, and transformational organizations, these missions often suffer an additional complicating factor: Large bureaucracies suffer in spades the policy-making, implementation and communication challenges that can derail even small, lean organizations.

Resilience is sometimes overlooked as a strategy for securing safety because it strikes managers, administrators, and policy-makers as almost irresponsible; they believe they must strive to prevent disasters, not wait to cope with them when they occur. Of course, prevention is preferable to resourceful coping, but that we aim to omniscience (and omnipotence) does not make it so. Many major disasters were never anticipated even as remote possibilities.

Even if trying to anticipate and plan for all the hypothetical low probability risks were not prohibitively expensive, the innovative organization would be wise to develop the capabilities of resilience. Any endeavor that boldly attempts to do what no one has done before will inevitably encounter unforeseen problems. Innovation teaches us not only what we do not know, but what we do not know that we do not know, i.e., of what we cannot yet conceive. Indeed, any truly innovative mission should strive to be at the forefront of not only scientific and technological knowledge, but also in the skills of organizational resilience.

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