

# Creating Value Through Resilience<sup>i</sup>

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## Promoting relevance

State and federal protection programs in the United States (US) focus on critical infrastructure and centrally-managed response/restoration of essential services. Resilience is an alternative risk management protocol that better addresses uncertainty, but requires redirection of metrics and management processes toward constant learning and adaptation, and a reversal in posture from loss minimization to value creation in the face of change. Useful concepts and techniques are available, especially from the military and social resilience communities of practice.

Presidential Policy Directive 21 (PPD-21), (2013) defines resilience as “*the ability to prepare for and adapt to changing conditions and withstand and recover rapidly from disruptions. Resilience includes the ability to withstand and recover from deliberate attacks, accidents, or naturally occurring threats or incidents*”. Recent military guidance addresses “*energy resilience*” (Office of the Assistant Secretary of Defense for Energy, Installations, and Environment) and “*personal resilience*” (Army Resiliency Directorate), calling respectively for sustained energy services and Soldier readiness. Except for incidental mention of “changing conditions” in PPD-21, the consistent emphasis is on significant, often stipulated events (e.g., hostile attack or flood). Conversely, researchers have presented resilience as a means to assure community welfare in the face of generic change and uncertainty. Holling (1996) distinguishes “*ecological resilience*” and “*engineering resilience*.” The former asserts holistic survival and sustainment through (for example) learning, healing, reproduction and evolution; the latter applying analogous principles to synthetic systems toward narrower goals of continued functionality and “*graceful degradation*.”

Although not naming resilience *per se*, Brafman (2008) describes organizations that thrive by learning and adapting on an ongoing basis, typically embracing decentralization and simple guidelines rather than extensive structure. Taleb (2014) observes that change is inevitable and frequent, and insists that the goal must be greater than simply surviving or mitigating losses. “*Antifragility*” directly contradicts structured and dependent systems and calls for portfolio solutions to hedge losses while maximizing gains; resulting in aggregated net benefit.

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## Crowdsourcing and the potential for 'everyday' impact

National Planning Frameworks (Department of Homeland Security, 2014) describe a structured, government-led approach for prevention, protection, mitigation and response to disasters, essentially ignoring 'normal' change. Recent federal government shutdowns due to severe weather threats in Washington, DC (FoxNews.com, 2016), illustrate the problem of binary thinking. Fortunately, publicity about such impacts has encouraged adoption of resilience-promoting practices such as telecommuting (Hughes, 2014); a "bottoms-up" capability that also provides value in non-emergencies. Latency in adoption highlights the impact of cultural issues – in this case, trust and comfort level with virtual interaction (Brown, Smith, Arduengo, & Taylor, 2016), not lack of institutional direction. To supplant "all-or-nothing" attitudes and promote proactive learning, Thomas and Kerner (2010) advocate adaptive management, emphasizing active sensing, cross-domain management, and change incentivisation.

In contrast to presumed government primacy in resilience-building, recent events such as Hurricane Sandy and the 2010 Haiti earthquake expose the importance of private citizen initiative before, during, and in the wake of emergencies. An Associated Press poll (2013) indicated that two-thirds of Hurricane Sandy victims in New Jersey drew needed assistance from neighbors and first responders, not government or insurance providers. When a few Tufts University students heard about the dire post-earthquake situation in Haiti, they organized an ad-hoc system of SMS (texting) and georeferenced databases, and recruited a global network of volunteer translators to collect, process and deliver status information to institutional responders (Morrow, Mock, Papendieck, & Kocmich, 2011). Substantial literature reports the power of virtual communities and social media as enablers for resilience (Meier, 2012).

## Capabilities as a foundation for resilience

Driven by diverse missions and uncertain environment, US military services define their operational requirements around defined force capabilities rather than specific system designs or operational procedures (Charman of the Joint Chiefs of Staff Instruction, 2015). Following this example, the National Preparedness Goal (Department of Homeland Security, 2015) prescribes 32 core capabilities, grouped under five mission areas: prevention, protection, mitigation, response, and recovery. Each capability includes an action-based description which, although directed toward disruptive events, could also contribute value more generally.

Military analytical processes could be useful in advancing resilience capabilities. To illustrate, the Army's "functional concept" for Mission Command (US Army Training and Doctrine Command) outlines concepts and capabilities that underlie Army doctrine, organization, training, materiel, leadership, personnel, facilities, and policies (DOTMLPF-P) associated with the Mission Command "warfighting function." Subordinate "warfighting challenges," such as "provide security force assistance," resemble preparedness capabilities (above). Required military capabilities, such as "globally networked teams" are more fundamental and inspire more powerful solutions across the range of DOTMLPF-P than do the specific task-based challenges they address. Roeger, Hope and Delaney (2014) suggest an adaptation of the military capability development process to community resilience-building.

Both FEMA and military constructs require insight elicitation from experts and stakeholders, translation into logical models, and decision processes. Mental models represent individual and collective beliefs, perceptions and attitudes which in turn drive behaviors, and provide useful bases for education, policy development and decision analysis (Morgan, Fischhoff, Bostrom, & Atman, 2002). Interviews, workshops, scenario-based exercises or more specifically structured processes as described by Grenier and Dudzinska-Przesmitzki (2015) may be used to expose and support synthesis of model taxonomies and criteria. Multi-Criteria Decision Analysis offers useful techniques to reconcile inevitably diverse and potentially divergent values and goals; it has been applied to similarly complex environmental decision-making (Linkov & Moberg, 2011).

### Criteria supporting an abundance paradigm

The National Academies (Disaster Resilience: a national imperative, 2012) compiled an extensive list of generalized resilience measurement models and criteria from various works. Norris, Stevens, Pfefferbaum, Wyche, and Pfefferbaum (2008) is cited for its broadly relevant measures based upon four key resources and their interactions: economic resources, social capital, information and communication, and community competence. The Rockefeller Foundation's Resilience Framework (2014) emphasizes individual and social components through such qualities as "reflective," "resourceful," and "inclusive." Collectively, these top-level measures composite diverse component metrics that importantly address the full range of situations, community (not just government) capabilities and capacity, and a value perspective that allows for a net gain.

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