

Business Resilience and Dealing with Economic Crises: Developing a Model to Measure Business Resilience

Glenn Varona, PhD
(Australian Institute of Business, Adelaide, Australia)

Abstract

Resilience is the capacity of any system, including business organizations and firms, to absorb the impact of an adverse event, adapt to it, recover effectively, and then return to a normal or better state. Studies on resilience have grown in recent times, covering various disciplines, including but not limited to individual human psychology and development, organisational dynamics, defence and security, community disaster response, and business continuity. In light of current financial and economic realities and the fact that businesses are facing increasing levels of risk, this paper proposes that:

- In addition to existing risk management and business continuity planning, business organizations should seriously start developing a business resilience capacity that could address whatever risk management or business continuity planning could not foresee or deal with, and;
- In developing a resilience capacity, the first step is to develop a conceptual model of what business resilience is and how to measure it which could be adapted to serve any business entity in any situation.

Introduction

Resilience research to date has focused on individual, organisational, and community resilience. For the most part, studies have tried to define resilience as a concept and then develop indicators and measures to identify and assess what makes an entity resilient. While these are useful for assessing and evaluating the resilience of individuals, organisations, or communities, there is a need for resilience studies to focus more on business and the wider economy (Rose and Krausman 2013).

There is no universal consensus on what resilience is, although a generally agreed definition states that it is the capacity of a system to absorb the impact of an adverse event, adapt to it, recover effectively, and then return to a normal or better state. The concept first began in the structural sciences, particularly in ship-building, and from there, its application extended into various disciplines in the health sciences, social sciences, organisational studies, defence and security, and business continuity. Furthermore, with modern society becoming more complex and interdependent, the original definitions of resilience have undergone redefinition and change (Whitehorn 2011, Rose and Krausman 2013, and European Network and Information Security Agency 2011).

To start with, resilience can be defined in general terms as the ability of a system to absorb the impact of an adverse event or situation, survive, recover, and even thrive in times of crisis (Stephenson, Vargo, and Seville 2010). A definition that sits within the business space sees it as the capacity of an enterprise to deal with turbulent change by surviving it, adapting to it, and then growing in the face of it (Fiskel 2006, Hamel and Valkingas 2003 cited in Dahles and Susilowati 2015, p. 37). It has also been defined as the capacity of a business to go beyond traditional risk management and Business Continuity Planning, to absorb disturbances, and to change, reorganise, and learn from the experience at the same time (Boggemann and Both 2014). The UNDP, while saying that there is no universal agreement on the meaning of the term, defines it as (UNDP 2014, p. 4):

a transformative process of strengthening the capacity of men, women, communities, institutions, and countries to anticipate, prevent, recover from, and transform in the aftermath of shocks, stresses, and change.

In all four perspectives, the common theme is the capacity to absorb the impact of an adverse event, adapt to it, recover effectively, and then return to a normal or better state. However, note that in the UNDP definition, the emphasis is on resilience being relevant in the aftermath of adversity, rather than in the midst of one. Like many studies in resilience, it looks at the ability to survive and recover from disasters, and the analytical starting point is the study of vulnerabilities (Rose and Krausman 2013, p. 73).

Economic Crises and the Business Entity

Business enterprises and markets are generally capable of adapting to pressure, risk, and adversity under ordinary conditions. But a crisis characterised by more severe and/or sustained pressure may lead to failure (Ando 2015, p. 108). The term ‘crisis’ describes a range of events that disrupt, dislocate, and/or adversely affect business operations in some way, shape, or form (Dahles and Susilowati 2015, p. 36). Considering that a great portion of the body of resilience research at the moment is in the public health, ecology, community, and disaster management disciplines, students of resilience for the business environment and the wider economic environment around it have to look at the possibility of a continuing crisis situation that is different from many disaster, health, community, or ecological situations and contexts (McAslan 2010).

With the possible exception of drought or other long term climate related event, most disasters, such as storms or earthquakes typically occur within reasonably short time frames (sudden or short term shocks). Even in business, there are such things as short to medium term adverse events that have to be dealt with, such as an IT glitch that can upset airline timetables, or volcanic eruptions that can ground air travel.

But businesses also have to deal with longer term and ongoing crisis situations that may not have a definite beginning or end (e.g. slow onset risks or continuing risks). It is even possible to see that slow onset risks, continuing risks, and sudden shocks are systemic in many cases. For example, Climate Change, which may be a slow onset risk (owing to the slow but long term consequences of all of its effects), has within it continuing risks (such as droughts, longer term El Nino events, etc.) and sudden shocks (such as powerful cyclones and wildfires). It is even possible to think of overlapping categories of risk in each of these areas (i.e. some wildfire events can overlap all three categories, as they may start as sudden shocks, and then develop into continuing risks, and then go on to become slow onset risks if they happen on a regular basis, as they do every year in Australia and California). The World Economic Forum (WEF) also mentions a type of continuing risk, called a ‘creeping risk’, which is a major concern for businesses around the world. An example of a creeping risk, according to the WEF, is pervasive, systemic, entrenched corruption (World Economic Forum 2013, p. 22).

The WEF regularly publishes its assessment of global risks and threats. It defines risks as events or conditions that are accompanied by uncertainty and can cause medium to long term adverse effects on nations and industries. The most recent edition of its global risk assessment puts interstate conflict, global governance failure, the collapse of states, massive unemployment, and Climate Change effects on global weather patterns as the most likely risks the world will have to address in 2015. In terms of impact, however, it presents water shortages, disease epidemics, interstate conflict, and the failure to adapt to Climate Change as the events that will affect the world the most (World Economic Forum 2015, pp. 8-9). Most of these are actually slow onset or continuing risks and threat. The irony of modern day free market economics is that the more open and supposedly free the market may have become, the more constraints there are to market activity owing to the increasing vulnerability of economic actors and processes.

Free trade and technological advances, long considered desirable qualities of the global economy that would facilitate business participation, bring with them vulnerabilities that could actually reduce the capacity of businesses to act in their best interests (Baker 2009). In addition, there are geopolitical,

governance, social, and ecological risks that business enterprises have to address, but not all of which are within their ability to control. Political and public policy decisions, for example, may be a form of risk that could lead to economic and business disruptions. This brings to mind the impact of recent national austerity policies among some Eurozone countries to local and regional financial and economic systems (Modica and Reggiani 2014, p. 212). To add to the complexity, there are risks and threats that are defined as having a very low probability of occurrence, but if they do occur their impact and effects are completely out of proportion to any other adverse situations in the normal scope of human existence. They could also occur unexpectedly and are often inappropriately rationalised after the fact. These risks have been termed, 'Black Swans' (Taleb 2005).

Resilience building, particularly in business, would have to focus on such a broad and extensive spectrum of threats and vulnerabilities, from slow onset to continuing risks and sudden shocks, and even Black Swans that come as a surprise from a totally left-field direction. It is argued here that a resilience perspective towards dealing with crisis and adversity from slow onset risks to sudden catastrophes, complementing existing risk and business continuity management strategies, is the best way forward for business (Varona 2012). It is critically important for an organisation or firm to develop a model towards developing business resilience and a means of measuring it in recognition of the fact that disruptions and adverse events can significantly impact and unbalance the economic environment within which businesses must operate (Modica and Reggiani 2014).

A Conceptual Model of Resilience for Business

It has been noted earlier that resilience research has been carried out in fields outside the business discipline. Rose and Krausman (2013) have argued that the models and metrics which have been applied to non-business disciplines, particularly in disaster and vulnerability studies do not have sufficient conceptual frameworks to formulate resilience models for business. Despite this, there are linkages across these fields, particularly in terms of resilient communities and resilient organisations, where the associated idea of resilience to facilitate competitiveness can be found (Lee, Vargo, and Seville 2013). Resilient organizations arguably are critical to and interdependent with resilient communities. Furthermore, the more resilient these organisations are, particularly those in business, the greater will be their competitive edge, which in turn, would mean stronger and more vibrant communities where they operate. Indeed, business resilience is a dynamic concept that enables enterprises not only to recover from an adverse economic, environmental, political, or financial situation, but also to adapt, innovate, and grow (Simmie and Martin 2010 cited in Courvisanos, Jain, and Mardaneh 2015, p. 3).

Companies such as IBM and Carnegie Mellon University, as well as professional networks such as Continuity Central have developed models and metrics for measuring business resilience. IBM has a Business Resilience Framework that identifies three types of risk: business driven risks, data driven risks, and event driven risks. It also has a model for analysing and dealing with these risks from a resilience strategy standpoint (IBM Governance and Risk Management 2007, pp. 3 and 7-10). Finally, IBM has a method for measuring resilience maturity, which is anchored around its Business Resilience Framework and is based on a 5-level rating scale that organizations can use to assess their resilience maturity, from Level 1 (Basic) to Level 5 (Resilient) (Cocchiara 2009, p. 3). Because it is IBM, it understandably places a heavy emphasis on the resilience of information technology and data in addition to all other organisational factors and components.

Carnegie Mellon University has a patented resilience management model known as CERT-RMM, which is geared towards operational resilience for organisations in complex environments. It is claimed to be innovative and transformative, and it relies on performance management principles such as benchmarking to develop a resilience capability. Like the IBM framework, it uses a measurement scale that starts from 0 (Incomplete Capability) to 3 (Defined Capability). It is based on a process management perspective (Caralli, et al 2010, pp. 3 and 54).

Continuity Central has developed a resilience maturity framework that is very similar to IBM's, but it is based on a Business Continuity Management perspective. It has a 7-level maturity scale starting from Level 1 (Basic Incident Response) to Level 7 (Resilience). Using the international standard for Business Continuity Management, ISO 22301:2012, it integrates resilience into business continuity as a strategic capability for business (Hinson and Koustic 2015, pp. 1-3).

Slack, Brandon-Jones, Johnston, and Betts (2012, p. 122) have developed a resilience concept meant for business entities. It is a transformation model based on three measurable variables: organisational, technological, and human. This model is a simple but effective approach, although it is largely applicable to operations and process management. There are limitations to its use in the other areas of a business enterprise. In any event, regardless of the methodology for assessment, measurement, and evaluation, optimising resilience for businesses requires a disciplined analytical approach that uses extensive and in-depth decision modelling (World Economic Forum 2013).

The focus of this paper is to try to develop a model for assessing and measuring resilience for a business enterprise caught in the midst of economic and other crises. The contributions already made in this field, as outlined in the foregoing paragraphs are important, but it is necessary to develop a model that is circumspect and robust, applicable to all possible business enterprises and not merely limited to specific industries, sectors, or contexts. It has been noted previously that many principles and concepts that are valid in looking at resilience for communities, individuals, disasters, IT systems, and physical structures among others, may apply with equal validity to business entities. What is important, however, is a model that looks into the business context. As a start, a good, circumspect definition of business resilience is suggested by the Resilience Action Initiative or RAI (Bresch, et al 2014, pp. 50-52): 'The capacity of a business to survive, successfully adapt, and prosper in the face of change and adversity.' This includes three dimensions:

- *Structural Resilience*: This focuses on the company and both its adaptability and systemic character as it tries to improve Business Continuity Management.
- *Integrative Resilience*: This focuses on the company and its complex relationships with its external environment.
- *Transformational Resilience*: This focuses on the long term adaptability of the company and its ability to learn and transform or change with the times.

It is important to note the concept of 'adaptive capacity', which is the ability of a business entity to not only absorb the impact of adversity, but also to learn from it, self-organise into a stronger and better enterprise, thrive amidst the situation (particularly during slow onset risk events), and even undergo transformation into something better (Lee, Vargo, and Seville 2013; Endfield 2012; Tierney and Brunau 2007; Whitehorn 2011; and Varona 2012). It is the ability of a business entity to exploit new opportunities quickly, manage complexity, and to read and respond to change indicators (Albani and Kupers 2014, p. 37). Adaptability alone does not constitute adaptive capacity. The latter is a much deeper and broader concept than mere adaptability. Adaptive capacity, as part of resilience, is an

embedded capability that allows for structural adaptability, integrative capacity, and transformational capacity.

The UNDP's concept of resilience, while not specifically business focused, uses a spectrum that goes from stability to flexibility and change. The more intense the change and the higher the transaction costs, the greater the need for transformation. Adverse events that a system can recover from reasonably well do not require much change, and so the resilience strategy could focus on persistence and stability. Adverse events that would require incremental changes from affected entities would focus on flexibility, and where change becomes a requirement, the focus is on transformation (Bene, Wood, Newsham, and Davis 2012 cited in UNDP 2014, p. 7).

The UNDP's resilience model can be represented as:

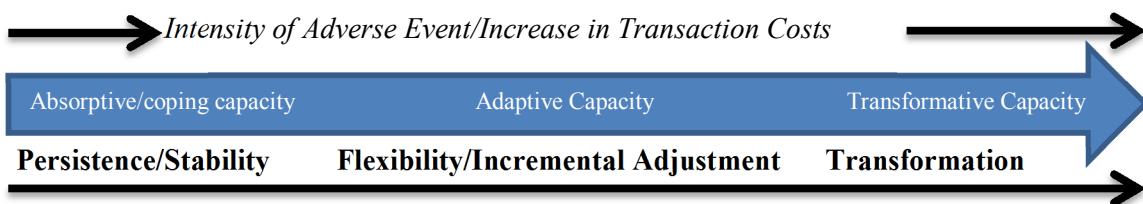


Figure 1: UNDP framework for strengthening resilience (derived from Bene, Wood, Newsham, and Davis 2012 cited in UNDP 2014, p. 7)

Absorptive capacity is arguably equivalent to structural resilience. However, it can be argued that adaptive capacity not only sits within the integrative resilience space, but it also overlaps to a degree with transformative capacity. Transformative capacity is comparable to RAI's Transformational Resilience dimension. Indeed, the UNDP framework is very similar to RAI's tri-dimensional understanding of resilience, albeit its focus is on community disaster preparedness and recovery. Even so, this indicates that the RAI's framework can be an authoritative approach to measuring resilience, seeing that it is conceptually similar to at least one other authoritative framework.

Note that it is often easier to focus on any one of the RAI's dimensions and accept that one dimension as the overall definition of business resilience. A popular understanding of business resilience is that it is the capacity of an enterprise to sustain the impact of business interruptions and then to recover and resume operations to provide a minimum level of services (Hyslop 2007, p. 9). This definition really sits within the area of Business Continuity Management, which is merely within the Structural Resilience dimension. It limits the understanding of resilience to the concept of adaptability. Lee, Vargo, and Seville (2013, p. 30) argue that, first, resilience is more than adaptability, and second, it requires the ability of any business enterprise to continuously question its environmental assumptions and detect the drift towards failure. In other words, business resilience involves both the ability to learn as much as to adapt, which when taken together, is the critical combination that makes possible adaptive capacity.

Both learning and adaptability enable it to survive and, if necessary transform, since by learning is meant the ability to let go of past norms or practices and to be open to, or experiment with new ways of doing things (Elliot and Macpherson 2010, p. 593), including radical new innovations. Business resilience necessarily involves learning that could enable business entities to change with the economic, political, social, and ecological conditions within which they operate, regardless of the threat of risks. It is an organizational or institutional quality as well as a measurable business objective (Kantur and Iseri-Say 2012, p. 770).

In Australia, the community of practice around the resilience space believes that resilience is strongest in business entities or communities that have all or a combination of (Whitehorn 2011, p. 403):

- A capacity for anticipating emerging threats and understanding their effects on the system's strategic goals and objectives (this belongs to the Structural Resilience dimension in RAI),
- A strong leadership capability that articulates and implements strategic goals and objectives even in difficult times (Structural Resilience),
- A supportive workforce working within a nurturing work environment (Structural Resilience),
- A strong networking/collaborative relationship with supply chain and distribution partners as well as other stakeholders (Integrative Resilience),
- A capacity to respond to and recover from disruptions quickly (Integrative Resilience), and
- An integrated approach to management that focuses on quality, risk, environmental, security, emergency, and resilience management (Integrative Resilience).

What is clearly missing in these elements is attention to Transformative Resilience, as RAI terms it, or in the words of the UNDP, Transformative Capacity. The closest element in the list above that may have some transformative potential is the capacity to respond to and recover from disruptions as quickly as possible. However, this is not a true transformative capacity, since it is merely adaptability rather than a full adaptive capacity that is able to transform into something different and to thrive in the midst of a crisis. Indeed, adaptive capacity is the centrepiece of the overall resilience of any system, including a business enterprise, or even a business network.

Taking the RAI dimensions as a starting point for developing a business resilience model, it is possible to look at it as a multi-level concept:

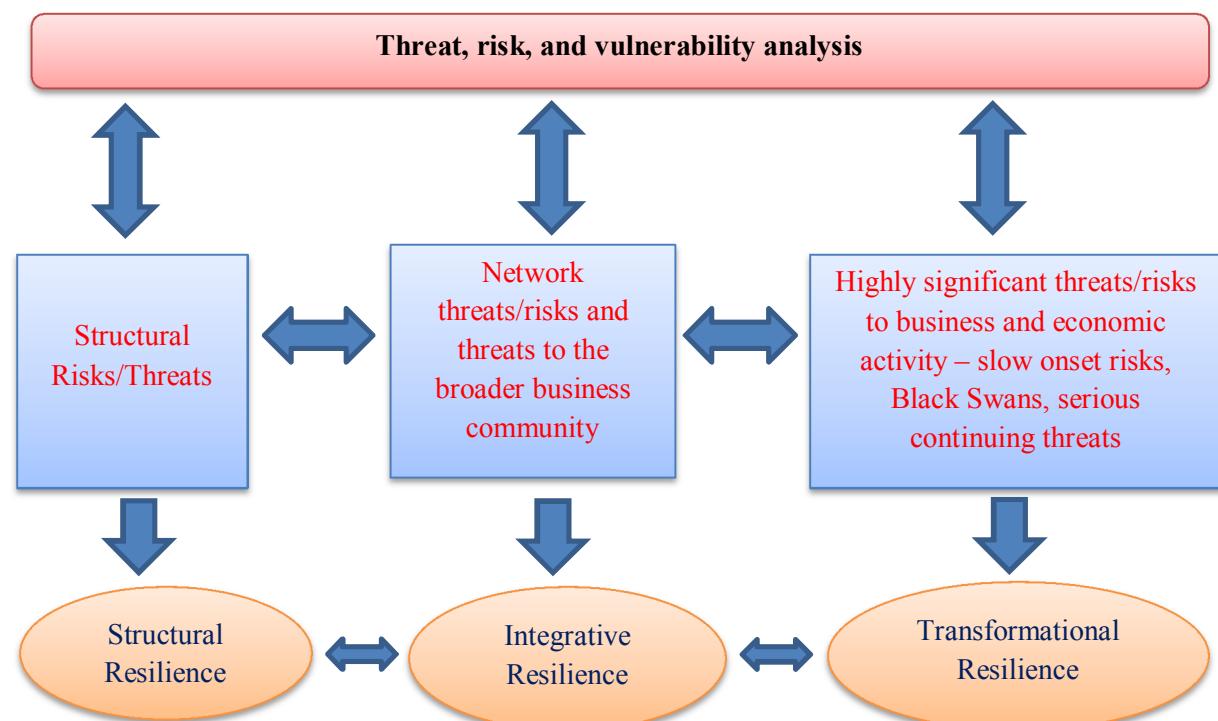


Figure 2: Proposed model for developing business resilience

The model is a three-level conceptual design that businesses can use to address their resilience needs in view of their extensive analysis of threats/risks and vulnerabilities. Risk and vulnerability analysis depends entirely on business needs, circumstances, and context. Scenario based analysis would be a circumspect methodology, since it begins with a series of possible outcomes that challenge preconceptions, identify blind spots, and facilitate an enterprise's development of strategic direction and action (Scenario-Based Strategic Planning in Times of Tumultuous Change 2012). Regardless of what methodology a business entity uses, however, risk and vulnerability analysis should be a multidimensional, in-depth, proactive, predictive, and emergent learning process. Collective and institutional learning is critical to developing a resilience capacity in all three dimensions, from Structural Resilience to Transformational Resilience (Elliott and Macpherson 2010). In effect, a business enterprise becomes a mindful entity, in that it possesses the following characteristics in its analysis of threats, risks, and vulnerabilities (Vogus and Sutcliffe 2012, p. 723):

- A regular, iterative, and robust process for discussing potential threats and risks;
- A regular, current, and highly nuanced method for questioning the adequacy of existing assumptions and looking into reliable alternative possibilities;
- A capacity to integrate these understandings into an updated big picture of the situation and context;
- A commitment to resilience through recognising the inevitability of adverse events and then analysing them thoroughly in order to learn from and adapt to them; and
- A capacity to defer to expertise rather than authority when making important decisions.

A mindful enterprise can develop resilience to crisis events and situations because it is capable of learning at every level, from the analysis of risks, threats, and vulnerabilities, to the development of resilience in the structural, integrative, and transformational dimensions.

It is also important to note that at every level of this model, from risk and vulnerability analysis to the development of resilience capacities at every dimension, collaboration with other business entities and partners, stakeholders, and competitors is critical, especially in the Integrative and Transformational dimensions. In effect, building and working through collaborative networks is essential to resilience building. Extensive research in social network analysis has been the consequence of the impact of globalisation and the increasing complexity of problems. The brittleness of organisations and communities, that is, their lack of resilience, can be the result of weak collaboration within equally weak networks (Moore and Westley 2011). It is clear that increasingly complex problems would require collaborative approaches to management and resolution (Reynolds and Holwell 2010). This is especially critical to the Integrative and Transformational Resilience dimensions.

A multi-dimensional risk and vulnerability analysis could define what dimensions of resilience are required to address an adverse event or crisis. Structural risks and vulnerabilities may require operating in the Structural Resilience dimension. More serious and extensive issues would require working in the Integrative Resilience dimension, and in both of these dimensions, the scale and level of risk and vulnerability may require only adaptation, recovery, and a return to normality. However, adverse situations that have a very severe impact, particularly over the long term (Black Swan events and/or slow onset threats) may make it necessary for business entities to transform and reinvent themselves, using the same threats and risks as possible sources of strength and opportunity. This, it can be argued, is the highest level of adaptive capacity, requiring resilience in the Transformational dimension. In this last instance, businesses under crisis can redefine normality, since returning to the

pre-crisis version of normality may no longer be possible. Thus, rather than returning to this no longer existing pre-crisis normality, Transformational Resilience enables business entities to change with the situation, operate effectively within it, and to thrive.

Measuring Resilience in Three Dimensions

Structural Resilience

In this dimension, the major threats to business could be addressed within a Business Continuity Management perspective. If in-depth, iterative risk analysis finds threats only in the structural components of a business enterprise, then resilience can be developed in four major components, taking and expanding them from McAslan's (2010) original three:

- *Physical components*: These would include the physical and material elements of a business enterprise, which may be, but are not limited to plant and equipment, staff and personnel, inventory, machinery and hardware, vehicles, infrastructure, and any other physical resources that businesses use to carry out their activities.
- *Procedural components*: These would refer to processes and the non-physical elements of a business enterprise, including but not limited to business records and information, supply chains, operational processes, strategic plans and planning, emergency and risk management programs, business continuity plans, corporate governance arrangements, staff training and professional development programs, stakeholder engagement strategies and activities, and any other processes or process driven components that allow an enterprise to function.
- *Financial components*: These are the parts of a business that include financial resources such as capital, cash and revenue flows, investments, reserves, and others.
- *Soft systems components*: These refer to those elements of a business operation that are not easy to quantify but are necessary as enablers of business activities, such as leadership, organisational culture and values, the capacity for organisational learning, business ethics, and others.

The criteria for measuring resilience at this level could include (Tierney and Bruneau 2007, Sheffi 2005, and Whitehorn 2011):

- *Robustness*: This refers to the degree to which a component can withstand a shock.
- *Redundancy*: This refers to the level of duplication of a component to increase reliability.
- *Adaptability* (including Organisational Learning Capacity): This refers to the ability of a component in a system to absorb and adjust to changing circumstances and situations.
- *Return Rate*: This refers to the time it takes for a system's components to return to normal operations after a shock, both projected and actual (with the latter assessable only after an actual event has occurred).

Applying these criteria to an assessment of structural business resilience would require an analytical matrix that could then be used as part of a balanced scorecard approach:

Structural Resilience Analysis for XYZ Pty. Ltd.	Robustness	Redundancy	Adaptability	Return Rate
Physical Components: • Buildings • Transportation • Supporting machinery • Number of staff • Etc.	Analysis and assessment	Analysis and assessment	Analysis and assessment	Analysis and assessment
Procedural Components • IT and Records • Strategic Plans • Supply Chains • Business Continuity Management • Etc.	Analysis and assessment	Analysis and assessment	Analysis and assessment	Analysis and assessment
Financial Components • Capitalisation • Reserves • Investments • Etc.	Analysis and assessment	Analysis and assessment	Analysis and assessment	Analysis and assessment
Soft Systems Components • Leadership • Company Values/Ethics • Organisational Culture • Human Resource Development • Etc.	Analysis and assessment	Analysis and assessment	Analysis and assessment	Analysis and assessment

Figure 3: Possible matrix for measuring Structural Resilience

Note that not all of these criteria can be given equal levels of assessment given limitations in resources, finances, or time. Thus, a priority structure should be assigned to each component of a business system in terms of which of these components are critical enough to require high marks as opposed to those components that a business may trade off because they are not as critical. This is based on the idea that a company or organisation cannot make all of its components equally robust, redundant, or adaptable, let alone enable all business systems and components to return to normality at the same time, due to limitations and constraints in resourcing and funding (McAslan 2010). Every enterprise can identify its own set of sub-components under each component, depending on its activities and priorities. For example, an IT company would significantly focus on information, hardware, software, and information management systems. It may not require as many vehicles or warehouse facilities compared to a transportation business. Thus, what each company considers as sub-components under each component would depend on its business model, activities, priorities, and requirements.

Assessing the robustness, redundancy, adaptability, and return rate of a business entity would depend on what that entity would consider appropriate to its situation and context. Anything from a simple numeric sliding scale such as what IBM uses as noted previously, to a complex performance management approach is possible to use as long as a reasonably clear picture of an enterprise's structural resilience is shown and is useful for planning and policy making purposes.

Integrative Resilience

More extensive threats and risks which may be beyond the capacity of business continuity management may arguably require developing and sustaining resilience in what is known as the integrative dimension. Integrative Resilience includes Structural Resilience, which must be duly assessed, and then in addition to this is the assessment of collaborative and networking capacity. Businesses facing long term or slow onset threats may attempt to adapt and survive on their own, but more often than not, collaborative efforts between and among business entities as well as between them and other stakeholders are the key to resilience across a business community. Work and research within the community and disaster resilience fields are rich with examples of multiple collaborative and network approaches to building, assessing, and sustaining resilience. In a UN International Strategy for Disaster Resilience (UN-ISDR) handbook on developing resilience for cities and urban communities, the first and most important essential requirement is an organised and coordinated multi-sectoral institutional framework. This involves a holistic coordination and integration of the plans and activities of central government agencies, local governments, civil society, business groups, academic institutions, neighbourhood groups, and other stakeholders towards the development of a strategy and capacity for resilience (How to Make Cities more Resilient: A Handbook for Local Government Leaders 2012). This can be possible in business communities as well.

Recent disasters in Japan, including the East Asian Tsunami and the Fukushima nuclear meltdown, as well as the aftermath of Hurricane Katrina in the southern United States have led to research on the role of social capital in building collective resilience. Social capital, understood as the ties and networks of trust and other human relationships within communities, can be a significant enabler or hindrance to resilience development and crisis recovery, depending on how strong or weak these networks and relationships are. High levels of social capital can help overcome barriers to collective action, which enables communities to recover better and faster.

It is interesting to note that the recovery from Hurricane Katrina's devastating effects could have benefited from a more strategic and equitable approach towards collaboration across business, community, policy, and institutional networks. The immediate efforts to recovery were based on a *laissez faire* approach, which left rebuilding decisions to individual businesses, residents, and organizations. In effect, little was done to take advantage of and work through the affected community's social capital and its networks of interdependent and collaborative people and institutions. The consensus among researchers in Hurricane Katrina's aftermath is that prior preparation and a more strategic approach to collective action involving government, residents, businesses, and civic institutions, which would have involved taking a strategic perspective on developing, using, and strengthening social capital could have enabled a more equitable and effective recovery (Brand and Seidman n.d. and Stephenson 2010).

Business entities should start thinking about strengthening networks and collaboration between and among themselves, as well as with external stakeholders such as clients, communities, government, academia, civil society, and others. Business networks, groups, and stakeholders working collaboratively within a common governance framework would arguably facilitate the development of an integrated, collective, cooperative approach to resilience building. In addition to the requirements of structural resilience, integrated resilience could involve:

Integrative Resilience Analysis for XYZ Pty Ltd		Components of Structural Resilience as Assessed	Components of Integrative Resilience		
			Network Strength	Network Extensiveness	Collaborative Capacity
Physical Components: <ul style="list-style-type: none">• Buildings• Transportation• Supporting machinery• Number of staff• Etc.	Analysis and assessment summary	Analysis and assessment where appropriate	Analysis and assessment where appropriate	Analysis and assessment where appropriate	Analysis and assessment where appropriate
Procedural Components <ul style="list-style-type: none">• IT and Records• Strategic Plans• Supply Chains• Business Continuity Management• Etc.	Analysis and assessment summary	Analysis and assessment where appropriate	Analysis and assessment where appropriate	Analysis and assessment where appropriate	Analysis and assessment where appropriate
Financial Components <ul style="list-style-type: none">• Capitalisation• Reserves• Investments• Etc.	Analysis and assessment summary	Analysis and assessment where appropriate	Analysis and assessment where appropriate	Analysis and assessment where appropriate	Analysis and assessment where appropriate
Soft Systems Components <ul style="list-style-type: none">• Leadership• Company Values/Ethics• Organisational Culture• Human Resource Development• Etc.	Analysis and assessment summary	Analysis and assessment where appropriate	Analysis and assessment where appropriate	Analysis and assessment where appropriate	Analysis and assessment where appropriate

Figure 4: Possible matrix for measuring Integrative Resilience

The idea behind this expanded matrix is that after Structural Resilience has been assessed and analysed, the next step is to assess and analyse the Integrative Resilience dimension, which would not be a complete picture if Structural Resilience were not evaluated first. Structural Resilience is, in effect, a prerequisite to effective Integrative Resilience. This is due to the idea that a business entity on its own should have a sufficient capacity to deal with structural risks, threats, and vulnerabilities before it can contribute to the strength of its networks and collaborative groups. The overall resilience of an integrated system is a function of the levels of resilience among its parts. The World Economic Forum (2013, p. 22) makes a strong argument for the strengthening of business partnerships to develop resilient supply chains. It argues further that strong partnership relations between and among business entities can be established through improved cooperation in security, information sharing, and the exchange of knowledge. Integrative Resilience could build on this concept and expand partnership relations into networks and collaborative business communities.

Business entities intent on building and sustaining Integrative Resilience should seek out ways of collaborating with other businesses as well as with governments, civil society, communities, clients, suppliers, and other stakeholders in areas where collaborative effort is appropriate. Determining the areas of collaboration would have to be negotiated and collectively determined among the firms, companies, businesses, and other entities that are part of the wider business network or community. In studies involving community resilience, it has been found that catastrophic events could be taken as opportunities for communities to strengthen community networks, social capital, and collaborative capacity, which would enable them to deal with future adversities (Paton and Johnson 2006 cited in Stephenson 2012, pp. 2-3). The achievement of high levels of resilience requires the cooperative participation of the broad cross section of businesses and business leaders working in a collaborative manner (World Economic Forum 2013). Furthermore, collaboration should extend beyond business enterprises to include the participation of other stakeholders in the community or business environment.

Transformational Resilience

The last dimension for resilience development is Transformational Resilience, which would enable a business entity not only to absorb, adapt, and recover from sudden shocks as an individual entity as well as being part of a strong network of businesses and stakeholders, but also to transform and thrive in situations where a return to a prior normality may not be entirely possible. Business resilience under sudden or short to medium term economic, political, or other shocks may seek to maintain output close to potential after the shock and return to the state of normality prior to the shock as soon as possible (Duval, Elmeskov, and Vogel 2007, p. 6). However, there may be problems returning to this state of normality if the adverse event is long term, slow onset, or creeping. In such instances, it may be that a business enterprise might have to transform into something completely different in order to adapt to the situation, thereby redefining the very idea of what is normal.

Assessing this would mean understanding the nature of transformation and adaptive capacity. Business leaders and managers would have to look at how well their businesses can and are able to transform amid a continuing crisis situation. This may involve a complete change in business activities, models, structures, supply chains, operational processes, and perhaps even organisational characteristics. As such, the main components for assessing Transformational Resilience would include a business entity's capacity for organisational learning, its capacity towards change in its organisational culture, and its ability to change from one business activity to another, perhaps even a completely and radically different one. This could even transform the continuing crisis into an emergent opportunity (Elliot and Macpherson 2010). Therefore, in addition to Structural and Integrative Resilience, the full assessment model would have to include:

Integrative Resilience Analysis for XYZ Pty Ltd		Components of Structural Resilience as Assessed	Components of Integrative Resilience as Assessed	Components of Transformational Resilience		
				Organisational Learning Capacity	Capacity for Culture Change	Capacity for Business Activity/Model Change
Physical Components: <ul style="list-style-type: none">• Buildings• Transportation• Supporting machinery• Number of staff• Etc.		Analysis and assessment summary	Analysis and assessment where appropriate	Analysis and assessment where appropriate	Analysis and assessment where appropriate	Analysis and assessment where appropriate
Procedural Components <ul style="list-style-type: none">• IT and Records• Strategic Plans• Supply Chains• Business Continuity Management• Etc.		Analysis and assessment summary	Analysis and assessment where appropriate	Analysis and assessment where appropriate	Analysis and assessment where appropriate	Analysis and assessment where appropriate
Financial Components <ul style="list-style-type: none">• Capitalisation• Reserves• Investments• Etc.		Analysis and assessment summary	Analysis and assessment where appropriate	Analysis and assessment where appropriate	Analysis and assessment where appropriate	Analysis and assessment where appropriate
Soft Systems Components <ul style="list-style-type: none">• Leadership• Company Values/Ethics• Organisational Culture• Human Resource Development• Etc.		Analysis and assessment summary	Analysis and assessment where appropriate	Analysis and assessment where appropriate	Analysis and assessment where appropriate	Analysis and assessment where appropriate

Figure 5: Possible matrix for measuring Transformational Resilience

Transformational Resilience would arguably work best among business enterprises that have already developed Structural and Integrative Resilience, since a capacity for transformation and the ability to see and exploit new opportunities during a long term crisis situation would require resilient structures and collaborative networks.

Please note that this model and its assumptions are not meant to be the final word on the subject of developing and measuring or evaluating business resilience. This is an ongoing work in progress, and any contributions to this conceptual framework would be welcome. Just as collaboration and collective effort are essential towards developing Integrative Resilience, a collaborative approach to developing this resilience framework would arguably lead to better outcomes.

Conclusion

The purpose behind this conceptual paper is to facilitate thinking about developing a business resilience capacity for enterprises in the midst of crisis which could address whatever risk management or business continuity planning could not foresee or deal with. In developing this capacity, a conceptual model of what business resilience is and how to measure it has been developed and presented as an approach towards this end.

Business resilience is becoming a critical issue for business enterprises in light of existing adverse events and long term crises in the economic, political, social, and environmental spheres. At one point, building and sustaining a resilience capacity could enable businesses to absorb, adapt, and recover from shocks and adversity. The objective of this is to return to pre-event normality as quickly and effectively as possible. But adverse events do not only affect individual businesses. Adverse events can have a wider impact on several enterprises as well as the wider community within which these enterprises operate. Furthermore, adverse events are not limited to sudden, short term, or medium term shocks that have a clear beginning and end. Many crises situations are long term, slow onset, or creeping risks. Such long term crises may require businesses to redefine normality and transform partly or wholly into new business enterprises.

It is in response to these issues that a tri-dimensional integrated model, fundamentally the framework of the Resilience Action Initiative, towards establishing, measuring, and assessing the resilience of businesses and business networks has been developed. As this is a work in progress, it is open to additional constructive input and further research from fellow researchers and practitioners who have an interest in making resilience work. Hopefully, an effective and comprehensive approach to developing and measuring business resilience could make it possible to deal with current and emerging crises.

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