Organizational Resilience: A Dynamic Capability of Complex Systems

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Abstract

In recent years, the concept of organizational resilience has largely attracted the interest of academicians and practitioners alike. A fair number of researches have been conducted on developing the concept of organizational resilience. However, there seems to be a lack of consensus over its conceptualization mainly because the concept itself is prodigious and is used in a variety of disciplines. Furthermore, research within the domain of organizational resilience has been outcome oriented; however, questions addressing the drivers of resilience are yet to be answered. On the other hand, research within the domain of dynamic capabilities view have long been criticized as tautological, resistant to operationalization, and lacking the unification of thought. However, there exists a sufficient degree of conceptual similitude between the two concepts, mainly due to their epistemological similarities grounded within the theoretical assumptions of chaotic systems, environmental dynamism, and systems thinking. Incorporating both perspectives in parallel for understanding the theoretical connections can lead to clarifications at an ontological level. Therefore, this paper attempts to propose a holistic model of organizational resilience by incorporating a lens metaphor of dynamic capabilities view. This paper is divided into four sections. The first section of this paper lays down the multidisciplinary discourses within the realm of organizational resilience. The second section highlights the management discourse about the conceptualization of organizational resilience. The third section of this paper uses a lens metaphor of

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dynamic capabilities view in an attempt to add depth to the concept of organizational resilience. The fourth and the final section attempts to propose the drivers of organizational resilience from a strategic viewpoint.

Keywords: chaotic systems, dynamism, dynamic capabilities view, organizational resilience.

1. Introduction

Organizations play an important role in economic growth. They yield goods and services, provide employment and a sense of belonging to the community. However, the ever changing nature of the modern world presents serious challenges for organizations that are often concealed and only becomes apparent once they become crises (Weick & Sutcliffe, 2001). The dynamic nature of such threats makes it important to identify all possible hazards and their outcomes (Vogus, Rothman, Sutcliffe, & Weick, 2014). For organizations, coping with such threats is necessary, irrespective of their structural and contextual dimensions (Vogus & Welbourne, 2003). External environment presents dire threats to organizations such as economic instability, terrorism, natural catastrophes, radical technological disruptions, power blackouts, just to name a few (Linnenluecke, 2017). They also present unique opportunities such as technological breakthroughs, infrastructure development, exploration of natural resources, development of trade agreements and others (El Sawy & Pavlou, 2008).

Organizations governed by complex systems cannot operate in traditional ways in order to cope with the uncertain situations pertaining to internal and/or external permutations (Madsen, 2010). Under such turbulent environmental conditions, organizations have to respond and portray resilience based characteristics, while operating within the parameters of their respective mission and objectives. However, research within the field of organizational resilience is relatively new, while academic efforts shedding light on its construct and dimensions remain in the form of a 'black box' (Duchek, 2014).

Although the term 'resilience' is a growing theme in business research, business practice, public policy and the popular press, its conceptualization has been quite varied across studies, mainly because the concept itself is prodigious and fragmented within the academic silos of resilient engineering, ecological studies, supply chain management, economics, psychology and financial management (Annarelli & Nonino, 2016).

Conceptual similarities and differences among these streams have not yet been explored, nor have insights been gleaned into any possible principles for developing resilience (Linnenluecke, 2017). This type of conceptual fragmentation has resulted in the lack of academic focus on the development of a possible conceptual framework for developing resilience capabilities within organizations.

Since resilience scholarship is primarily concerned with the development of organizational adaptability to adverse environmental conditions (Stephenson, 2010), incorporating the perspective of dynamic capabilities into the resilience theory can advance the discussion by providing a holistic view of organizational resilience that takes into consideration the potential impact of both 'adverse' as well as 'promising' situations. Here, the integration of dynamic capabilities framework stresses the need for developing 'higher order' capabilities that enable organizations to effectively and rapidly reconfigure their current internal and external resources in response to both opportunities and challenges arising within their dynamic environment (Teece, Pisano, & Shuen, l997; Teece, 2007).

This can be viewed as the theoretical extension of the seminal resilience scholarship, much of which stresses the need for building organizational slack (Freeman, Maltz, & Hirschhorn, 2003; Gittell, Cameron, Lim, & Rivas, 2006; Hutter, 2013) from a resource-based view (RBV) to dynamic capabilities view (DCV) of organizations. In fact, contemporary business research aiming at incorporating both resilience based view and capabilities based view of the firm is relatively new and there has been only few attempts to conceptualize organizational resilience as a dynamic capability of organizations (Limnios, Mazzarol, Ghadouani, & Schilizzi, 2014; Mandal & Pattni, 2016; Yang & Smyrnios, 2018).

Furthermore, not only there is a dire need to understand organizational resilience from a multidisciplinary standpoint but there is a need also to highlight the nature and relationship of several antecedents that may affect the resilience capability of organizations needed to cope with the external and internal complexifications (Wokutch, Singal, Gerde, & Naar, 2016). This notion is based on the view that studying organizational resilience in isolation to understand how organizations are 'organized' to support a resilience initiative presents only a marginal solution towards developing a dynamic model of organizational resilience. In this endeavor, the integration of dynamic capabilities framework also provides a fruitful extension of organizational resilience theory, from its conceptual debate towards the identification of several necessary antecedents, such as organizational

leadership (Morales, Barrionuevo, & Gutiérrez, 2012), availability of organizational slack (Hutter, 2013), organizational learning capability (Nathanael & Marmaras, 2006), and climate of trust (Fainshmidt & Frazier, 2017) required for nurturing organizational resilience capabilities. There are two fundamental questions which become apparent from the above discussion. The first question is how can organizational resilience be conceptualized? The second question is how do certain capacities (resources, structures, processes) lead to organizational resilience?

1.1 Research Significance

The surge in globalization and megatrends of the 21st century has led to organizations facing challenges of the postmodern society. Today, a greater challenge for organizations is associated with the dynamic nature of varied challenges that has pressured organizations to incorporate a sense of resiliency, not only at operational level but also within their strategic orientation (Annarelli & Nonino, 2016). The challenge is not to find a solution for every problem that an organization faces but to have a clearly defined process of resilience management embedded within its strategic management framework. The failure to understand the importance of such processes leads organizations in a "firefighting" mode when crisis occurs.

Globally, severe aftermaths of global financial crises of 2007-2008 included economic strains in terms of unemployment, real estate value losses, and a sizeable increase in federal debts due to the loss of taxable revenues (Reinhart & Rogoff, 2009). Similarly, the negative demand shock of more than 30% in airline industry due to the terrorist act of 9/11 resulted into airlines such as United Airlines and U.S Airways to file for bankruptcy (Ito & Lee, 2005). Locally, developing organizational resilience has been the key concern for almost all of the business sectors within Pakistan. For instance, the recent surge of technological advancement (3G/4G) within the cellular telecommunication has increased the trend of 'branchless banking' and has questioned the long held competence of traditional professional banks (vast network of branches) in Pakistan. Yet only a handful of these professional banks have been able to expedite their banking process by fully integrating the current financial services with the inclusion of Fintech (Financial Technology) in a variety of online based and application based products (Khan & Rashid, 2015; Temelkov & Samonikov, 2018). The rest of the financial incumbents seems to follow a necessity based approach, what (Teece, 2007) highlights as a 'me too' strategy, to incorporate Fintech into their services offerings.

It is now obvious that new alternatives should be developed and implemented, especially in the emerging countries, where access to finance for the underprivileged is highly limited. It is important to note that financial regulators in Pakistan prefer Fintech implementation since it brings much needed transparency in financial exchanges, increases the accessibility to finance, and supports anti-money laundering operations (Zaffar, Kumar, & Zhao, 2019). Therefore, an integrative framework of organizational resilience can provide policy implications for state institutions to inculcate the required structural changes within the banking sector of Pakistan. Furthermore, the integrative nature of organizational resilience framework has benefits for other industries undergoing radical transformations, such as education, medicine, logistics, and hospitality sectors. In this sense, an integrative framework of organizational resilience can provide the basis for the composition of necessary resilience development centers.

2. Literature Review

Related literature, although abundant, in its attempt to shed light on organizational resilience is entangled with streams of research output originating from multiple domains of knowledge. Though the concept is often discussed, there seems to be little consensus about the conceptualization of the subject. More interestingly, it is not because there have been fewer attempts towards such scholarship, but mainly because of the dynamic, contextually driven, conceptually vague, multidisciplinary and integrative evolutionary nature of the subject matter (Linnenluecke, 2013; Limnios et al., 2014; Duchek, 2014; Hartmann, 2015; Kossek & Perrigino, 2016; Linnenluecke, 2017; Yang & Smyrnios, 2018). Resilience is both a multifaceted and a multidimensional concept (Ponomarov & Holcomb, 2009) which tends to incorporate systems and sub-systems within an organization and focuses on environmental uncertainties arising from multiple levels of analysis, that are both internal and external to the system. Therefore, literature review is organized in an integrative fashion that is specifically useful to resolve inconsistencies and tensions that exist in organizational resilience literature (Torraco, 2016). The aim of this literature review is twofold. Firstly, a comprehensive literature review is conceptually organized highlighting the multidisciplinary historicity of organizational resilience. Secondly, literature review attempts to present a new perspective of organizational resilience in an attempt to understand how organizations are ‘organized’ in order to support a resilience initiative within them.

2.1 Organizational Resilience and its Multidisciplinary Historicity

Resilience is both a multifaceted and a multidimensional concept (Ponomarov & Holcomb, 2009). Organization systems are composed of interrelated components and subsystems of complex networks which interact in a non-linear fashion and give organizations their identity (systems theory) (Millett, 1998). However, ever changing environmental conditions (Boyne & Meier, 2009) directly affect the ability of organizations (positively or negatively) to perform and gain competitive edge (Pisano & Teece, 2007). In this sense, resilience theory towards organizational systems incorporates a multidisciplinary approach through the integration of a diversity of views. This section tends to explore the concept of resilience from a multidisciplinary perspective.

The concept of resilience has firm bases within the area of ecology and has gained considerable recognition through the works of (Holling, 1973; Walker, Holling, Carpenter, & Kinzig, 2004). Fundamentally, the concept of resilience is defined as 'the ability of an element or a system to return to a stable state after being disrupted or changed' (Gunderson, 2000). Others have shed light on this concept from the perspective of system dynamics and have emphasized the capacity of the system to absorb disturbances while retaining essentially the same functions (Walker et al., 2004). Some researchers have identified resilience as the ability of the system to learn and adapt, while taking the perspective of human environment into account to deal with environmental uncertainty and risk (Adger, Hughes, Folke, Carpenter, & Rockström, 2005). In short, ecological perspective defines resilience as the ability of the system to achieve stability under stressful conditions which posts threats to its survivability. Contemporary literature within the domain of ecological system resilience fosters the need for building diversity and adaptive responses in the face of climate perturbations (Bullock, Dhanjal, Milne, Oliver, Todman, Whitmore, & Pywell, 2017). Others have proposed systematic processes for building resilience in socio-ecological systems comprising resistance, recovery, and reorganization of systems in adverse environmental conditions (Falk, 2017).

The second major domain within the literature which employs the concept of resilience is resilience engineering. Essentially, the focus of resilience engineering has been the development and refinement of decision making tools for industries. McManus, Seville, Vargo, and Brunsdon (2008) highlighted the concept of resilience from the perspective of resilience engineering. According to them, resilience defines the capacity of a system to maintain its ability of operation within acceptable standards. In

other words, a resilient system is able to maintain its ability to function properly despite interruptions or failure (Catalan & Robert, 2010). Robert and Hémond (2012) presented three essential components which emerge from the conceptualization of resilience. They are described as follows,

- The required 'knowledge' for the understanding of a system and its proper functioning.
- The level of 'acceptability' or threshold in case of disturbances which a system can absorb.
- The level of 'adaptability'; a system can change in order to align itself with different environmental conditions.

In short, resilient engineering emphasizes being proactive rather than reactive to adverse situations (Woods & Hollnagel, 2017). Although, the conceptual basis pertaining resilience seems similar between socio-ecological and engineering perspectives but the purpose of formalizing the underlying concept is entirely different. In a way, resilient engineering emphasizes the forward looking aspect of the system.

Within the field of economics, resilience is generally defined as the quality of the region to return to its state of equilibrium (it can be composed of several equilibria) after being disturbed. In this context, regional resilience is defined as the economic success of a region over a long term period with respect to changes in internal competition through its ability to adapt and change (Christopherson, Michie, & Tyler, 2010). Key factors that nurture this ability to adapt are summarized in Table 1 below.

Table 1

Factors that Nurture Organizational Adaptability

Factors	Source
Policies that encourage innovation within the region	(Clark, Huang, & Walsh, 2010)
Public policies that support the transmission of knowledge to economic agents	(Archibugi & Lundvall, 2002)
Strong financial system that supports capital structure	(Christopherson et al., 2010)
Diversity within economic system through supporting a variety of industries	(Archibugi & Lundvall, 2002)

Moreover, Simmie and Martin (2010) argue that regions or organizations working in a locality should focus on enhancing their adaptive

capability if the nature of economic environment is characterized as 'restless'. Based on the assumption that economic conditions are not entirely in the control of the agents, organizations should also focus on trade-offs between an internally strong structure of the organization which is more resistant to change and a more flexible form of an organization that can easily alter its way of doing business based on the required conditions. Contemporary research within the domain of regional economic resilience defines the concept as the ability of resistance (degree of sensitivity or depth of reaction to recessionary period), recovery (degree of recovery in terms of speed and magnitude after disruptions) and reorientation (degree of adaptability and rejuvenation of the region in the face of disturbance) (Faggian, Gemmiti, Jaquet, & Santini, 2018; Xie, Rose, Li, He, Li, & Ali, 2018). Table 2 summarizes the multidisciplinary views on organizational resilience.

Table 2
Multidisciplinary Discourses on Organizational Resilience

Perspective	***Socio-ecological Systems***	**ACS**	**SR**	**CA**	**ND**	**LCI**
(Walker et al., 2004)		x				
(Redman, Grove, & Kuby, 2004)			x	x		
(Folke, Carpenter, Elmqvist, Gunderson, Holling, & Walker, 2002).				x	x	x
(Bullock et al., 2017)				x	x	
(Falk, 2017)				x		
Perspective	***Resilient Engineering***					
(McManus, Seville, Vargo, & Brunsdon, 2008)		x				x
(Robert & Hémond, 2012)		x	x	x		

(Woods & Hollnagel, 2017)		x	x		
Perspective	***Economy and Public Policy***				
(Christopherson et al., 2010)		x			
(Archibugi & Lundvall, 2002)				x	
(Clark et al., 2010)					x
(Wolfe, 2010)			x		x
(Faggian et al., 2018)		x	x		x
(Xie et al., 2018)		x	x		

Source: Compiled by authors
Note: ACS= Absorptive Capacity of Systems; SR= System Recovery; CA= Continuous Adaptation; ND= Nurture Diversity; LCI= Learning Capability and Innovation.

2.2 Management Perspective towards Organizational Resilience

Coutu (2002) tends to explain the phenomenon of organizational resilience from the perspective of organizational people. According to him, resilience is the characteristics of people which becomes apparent under stressful conditions. Furthermore, resilience shouldn't be confused as an attribute having ties with the ethical nature of human beings. In fact, it is merely a capacity of a person to stand up in the face of difficulty and adversity. In other words, this property is referred to as 'bouncing back' in order to counter problems. In this sense, organizational resilience comprises the 'bouncing back' capacity of the people working within a social system.

Taking a 'systems perspective' of organizations, Dalziell and McManus (2004) defined organizational resilience as the dynamic capability of complex organizations to account for their vulnerabilities and the self-organization capacity of the organizations to alter their management infrastructure and practices when change is required. Nathanael and Marmaras (2006) put forth the concept of repetition of actions that reinforces actions required to solve ongoing problems. In such cases where problems persist, reflection in action can be employed by organizations to

alter their practices. In this manner, altered practices that help resolve the issues are further reinforced within organizational systems.

McManus et al. (2008) took one step further and presented a framework of organizational resilience construct. According to them, organizational resilience comprises managing vulnerabilities and should also include the ability of the organization to be fully aware of its environment. This particular ability requires organizations to develop a forward looking mentality by sensing opportunities and threats which exist within the organizational environment. Furthermore, McManus et al. (2008) proposed a practical model of organizational resilience management. In this model, organizational resilience is conceptualized as composed of processes that focus on building resilience on a day to day basis through which small disturbances and anomalies can be detected before they can cause a severe impact.

Lee, Vargo, and Seville (2013) took a more objectivist approach towards the construct of organizational resilience. They formally developed a tool for measuring organizational resilience based on three important dimensions, namely the level of organizational situational awareness, management of organizational vulnerabilities and enhancement of organizational adaptive capacity. According to them, the role of leadership and supportive management structure is considered the part of organizational adaptive capability. A suitable resilience culture also contributes in the planning strategies for the management of vulnerabilities in face of adverse environmental conditions (Seville, 2008).

In this regard, Limnios, Mazzarol, Ghadouani, and Schilizzi (2014) considered organizational resilience as strategic maneuvering (offence vs. defense) in the face of environmental uncertainty. According to them, organizational resilience can be seen as an adaptive system that maintains a balance between exploitation (internal resources) and exploration (acquiring resources from outside of the organization) in order to gain a strategic fit in the face of environmental uncertainty. Building on the foundational work of McManus et al. (2008) and Stephenson (2010) not only provided conceptual depth but also a measurement scale for organizational resilience. According to him, organizational resilience is a function of multiplicative properties of organizational situational awareness of its surroundings, management of its keystone vulnerabilities, and its adaptive capacity to transmute in the face of adversity. Similarly, Tadić, Aleksić, Stefanović, and Arsovski (2014) performed a relative analysis of

organizational resilience factors in order to rank them based on their level of importance.

Organizational resilience is further studied at an individual level of analysis where seminal work of Näswall, Kuntz, Hodliffe, and Malinen (2015) conceptualized organizational resilience as a form of employee capability to utilize existing resources in order to adapt positively to challenging situations. While Britt, Shen, Sinclair, Grossman, and Klieger (2016) further highlighted the role of positive adaptations and learning outcomes that are demonstrated by the employees of an organization after adverse situations.

Recently, Koronis and Ponis (2018) argued that traditional frameworks of crises management necessarily focus on recovery based approaches towards understanding organizational resilience, something that happens after the crisis is struck, while these approaches undermine the strategic aspects of handling adversities and recovery after crisis. Table 3 summarizes the management discourse on organizational resilience. It can be observed from the table that most of the literature emphasizes three important dimensions of organizational resilience which are 'adaptive capability of systems', 'situation awareness of systems' and 'management of key vulnerabilities'. Furthermore, all three dimensions are conceptualized as organizational processes/routines.

3. Conceptualizing Organizational Resilience through Dynamic Capabilities Lens

Central to the theme of organizational resilience is its conceptualization as a form of organizational dynamic capability. There exists a sufficient degree of conceptual similitude between the two concepts mainly due to their epistemological similarities within the theoretical assumptions of chaotic systems, environmental dynamism, and achieving competitive advantage. Incorporating both perspectives in parallel for understanding the theoretical connections can lead to clarifications at an ontological level. Literature of dynamic capabilities view serves as a fruitful source of adding to the conceptual depth of understanding the phenomenon of organizational resilience by employing a lens metaphor. The lens in this case is the dynamic capabilities perspective and the phenomenon is organizational resilience. Therefore, this section attempts to propose a holistic model of organizational resilience by incorporating a dynamic capabilities perspective. The following sections lay down the fundamentals of

theoretical contribution to organizational resilience theory keeping in view the dynamic capabilities framework.

Traditionally, organizational resilience is conceptualized as a form of crisis management tool (McManus et al., 2008) with the functions of situational awareness, adaptive capability, and management of keystone vulnerabilities. However, solely attributing crisis management capability as the spirit of resiliency marginalizes the true essence of the concept of organizational resilience. For example, Teece (2017) highlighted that firms dynamic capabilities not only weaken through poor diagnosis of vulnerabilities but also due to the failure of an organization to scan its competitive opportunities. Similarly, Danneels (2016) noted that second order organizational capabilities not only help them to cope with the environmental challenges but also enable them to use various technological and market related resources to grow into new directions.

As discussed earlier, understanding the concept of organizational resilience requires understanding the forms of processes, tasks, operations, and routines which can be labeled as the capacity of organizations to prepare and cope up under the times of hardships and uncertainties in their environment.

Table 3
Common Themes Central to the Management Discourse on Organizational Resilience

Authors	AD	SA	MKV	LC
(Weick & Sutcliff, 2001)	x	x		
(Coutu, 2002)	x			
(Bell, 2002)				
(Dalziell & McManus, 2004)	x			
(Nathanael & Marmaras, 2006)				x
(McManus et al., 2007)		x		
(Seville, 2008)	x	x	x	
(McManus et al., 2008)	x	x	x	
(Chiva & Alegre, 2009)				x
(Lee, Vargo, & Seville, 2013)	x	x	x	
(Limnios et al., 2014)	x		x	
(Tadić et al., 2014)	x	x	x	

(Näswall et al., 2015)	x			
(Britt et al., 2016)	x	x	x	
(Annarelli & Nonino, 2016)	x	x		
(Koronis & Ponis, 2018)	x	x	x	x

Source: *Compiled by authors*

Note: AD= Adaptive Capability; SA= Situational Awareness; MKV= Managing Key Vulnerabilities; LC= Learning Capability

In this view, organizational resources (both tangible and intangible) play a vital role in their defense and survivability. However, they need to be upgraded, better yet, to evolve, keeping in view the nature of internal and external risks and opportunities the system is exposed to.

Furthermore, capabilities based approach to resilience offers two key advantages. Firstly, both organizational resilience and dynamic capabilities emphasize organizational persistence under the conditions of change. Persistence in this sense is survivability for the former (Yang & Smyrnios, 2018) and competitive advantage for the latter (Teece, 2007). While change refers to managing crisis for the former (Lee et al., 2013) and gaining an opportunity for the latter (Eisenhardt & Martin, 2000). Integrating the two views together provides a holistic understanding of what it means to be persistent.

Secondly, the capabilities perspective integrates organizational resilience as a part of the set of activities. In this sense, activity sets (robust and reliable routines of action) are applied to existing resources yielding competitive advantages which comprise dynamic routines and actions to create, extend, and reconfigure its resources (Ambrosini & Bowman, 2009). This division of routines in the context of resilience allows a segmentation of actions towards building robust adaptations at various levels of organizational endeavor.

3.1 Resilient Sensing Capability

In his classic work, Teece (2007) elaborated on the attributes of dynamic capabilities in terms of SSR (Sensing, Seizing, and Reconfiguring) framework. According to him, sensing entails processes of knowledge exploration, scanning the external environment in pursuit of increasing awareness about competition, customers, and technological shifts (threats as well as opportunities). Interestingly, the sensing dimension of dynamic capability has also been emphasized as an integral part of the organizational resilience construct. For example, Vogus and Sutcliffe (2007a) emphasized the investigative behavior of the organizations and individuals to learn and

act upon in contrast to behaving in a deterministic way under stiff environmental conditions. Similarly, McManus et al. (2008) taking a system view perspective, entails organizational situational awareness as a property of resilient organizations to continuously be aware of their environment both at an individual and an organizational level. Dynamic capability in this sense allows the firm to sense such information and integrate it into its knowledge resources (Vogus & Sutcliffe, 2007a).

Therefore, this paper adds to the definition of situational awareness capability laid down by Stephenson (2010) and conceptualizes it as a form of organizational sensing routines that allow it to be aware of its external business ecosystem (opportunities and threats) by identifying its potential anomalies in and out of system on a regular basis, share the insights within the organization and its channel partners, clearly define roles and responsibilities, and setup recovery priorities and processes to tap into developments in rising opportunities (process or product technologies).

3.2 Resilient Seizing Capability

While sensing environmental opportunities and threats enables the organization to be aware of its surroundings, they are not sufficient until there is something organization can do about them. Seizing is the name of realizing these opportunities and managing the key vulnerabilities to better cope with uncertainties. Schumpeter (1942) creative destruction illustrates this phenomenon beautifully by highlighting the tendency of new emerging technologies to outperform incumbent firms' established technologies. Clearly, in this era of rapid technological advancement, incumbent firms' ability to invest into new technologies is marginalized by their tendency of inertia (Christensen, 2013). Stephenson (2010) defines the concept of managing keystone vulnerabilities as the ability of the organization to identify key vulnerabilities in relation to its business environment and build stimulations that enable the organization to practice planned recovery based approaches through mobilization of its bundle of internal and external resources. Although management of vulnerabilities ensures plans of action in crisis based situation(s); however, capitalizing on those plans sometimes requires organizations to perform strategic maneuvers that require considerable investments.

Central to this idea is the capacity of the organization to invest into new resources, innovations, and change (Teece, 2007), which holds an equal importance as having planning strategies and simulation exercise. For this reason, this paper adds to the definition of Stephenson (2010) and defines

management of keystone vulnerabilities as the organization's seizing capability to not only establish robust processes for identifying and analyzing system vulnerabilities but also to invest in key internal and external resources (material, financial, tacit knowledge, and network) required to address such issues. Therefore, management of the dimension of vulnerabilities presents a more inside out approach which is similar to the resource based view (RBV) of the organizations.

3.3 Resilient Reconfiguration Capability

McManus et al. (2008) identifies the adaptive capacity to be at the heart of organizational resilience construct. Adaptive capacity entails the ability of an organization to continuously evolve in order to create a match between organization's systems and its external environmental requirements (Seville, 2008). Similarly, multidisciplinary approach emphasizes continuous adaptation as the system's ability to change in the light of uncertain conditions (Robert & Hémond, 2012). While Carmeli and Schaubroeck (2008) emphasized the role of organizational learning process dedicated to gathering experience learnt from past and present lessons of system failure and recovery based approaches. Teece (2007) further noted that centralized governing structures within the organizations create connectivity disjoints between the top management and the ground realities. These forms of rigidities create knowledge gaps and slow down the response rate to potential opportunities or threats.

Therefore, this paper conceptualizes adaptive capacity as the dynamic capability of the organization to reduce silo mentality, develop a unified strategic vision, and reconfigure its assets and structural mechanisms according to the changing market and technological conditions. Table 4 summarizes the conceptualizations associated with the dimensions of dynamic organizational resilience.

4. Drivers of Dynamic Organizational Resilience

Research within the area of organizational resilience has put considerable efforts towards conceptualizing the phenomenon of organizational resilience; however, such proliferation of concepts has presented a fragmented view of the core concept of resilience. Therefore, the following section tends to answer the second research question associated with this conceptual paper.

4.1 Organizational Learning Capability and Organizational Resilience

Developing resilience attributes requires organizations to learn and retain the new practices into their systems and therefore learning serves both as

input and output of organizational resilience processes (Vogus & Sutcliffe, 2007b). Knowledge in this sense is considered a unique resource which can help the organizations to develop or reshape their practices in order to gain and retain a competitive advantage (2002).

Table 4
Dynamic Organizational Resilience Defined

Dimensions	Conceptualization
Resilient Sensing	Organizational routines that allow it to be aware of its external business ecosystem (opportunities and threats) by identifying its potential anomalies in and out of system on a regular basis, share the insights within the organization and its channel partners, clearly define roles and responsibilities, and setup recovery priorities and processes to tap into developments in rising opportunities (process or product technologies).
Resilient Seizing	Organizational routines that not only establish robust processes for identifying and analyzing system vulnerabilities but also invest in key internal and external resources (material, financial, tacit knowledge, and network) to address such issues.
Resilience Reconfiguration	Organizational routines that reduce silo mentality, develop a unified strategic vision, and reconfigure its assets and structural mechanisms according to the changing market and technological conditions, thus allowing organizations to effectively and rapidly adapt to unique situations.

Logically speaking, it is not possible for organizations to indulge in knowledge exploration and exploitation strategies until they build a sufficient learning capability in the first place. Chiva and Alegre (2009), while presenting the construct of organizational learning capability, explained that it is associated directly with the organizational level of experimentation, level of risk taking and the level of interaction with external environment. According to them, organizational learning capability

facilities the processes of learning within organizations and thus is a necessary condition that enables organizational learning process.

Proposition 1: Organizational learning capability is positively related to building and sustaining organizational resilience capability.

4.2 Role of Organizational Leadership

This paper argues that role of leadership is the necessary component of organizations which enhances its management resilience in order to bring about the right change, improve behavioral qualities of people, nurture diversity and support a learning culture. This is consistent with the findings of Besuner and Bewley (2017), who studied the role of organizational leadership in nurturing organizational resilience with reference to healthcare systems. According to them, leadership plays a significant role when there are pressing organizational issues and stiff environmental conditions. Similarly, Morales, Barrionuevo, and Gutiérrez (2012) found empirical evidence between transformative leadership and dynamic organizational processes of learning. Furthermore, Teece (2007) highlighted the role of leadership as a 'micro-foundation' in developing organizational dynamic capabilities.

Proposition 2: Role of organizational leadership positively influences organizational resilience capability.

4.3 Climate of Trust and Organizational Resilience

Building effective communication channels, which is one of the characteristics of resilient organizations, requires an increased level of trust within the organization (Serva, Fuller, & Mayer, 2000). Empirical evidence shows that trust is an essential condition vital for sustaining organizational resilience (Serva et al., 2000). It becomes important for organizations to ensure a high degree of trustworthy relationships not only inside (between the people working inside the organization) but also outside (between people working inside and stakeholders) of the organization.

Fainshmidt and Frazier (2016) further argued that organizational climate of trust is theoretically linked with social exchanges of knowledge and information processes because they facilitate adaptability and coordination among organizational members. Keeping in view the above discussion, this paper conceptualizes organizational climate of trust as an important antecedent to the dynamic component of organizational resilience.

Proposition 3: Organizational climate of trust is positively related to building and sustaining organizational resilience capability.

4.4 Availability of Slack Resources

As discussed earlier, the availability of an organization's financial resources is essential for the survival of the organization under adverse environmental conditions. Vogus and Sutcliffe (2007a) noted that the availability of slack resources (relational or financial) enables organizations in stiff environmental conditions to survive without layoff that allows the firms to retain knowledge assets within their system. However, financial resources are neither sufficient nor define what it means to be resilient under stiff environmental conditions. As discussed earlier, it is the deployment and reconfigurations of resources that allows the firms to be resilient. We therefore propose the following proposition.

Proposition 4: Availability of slack resources is positively related to building and sustaining organizational resilience.

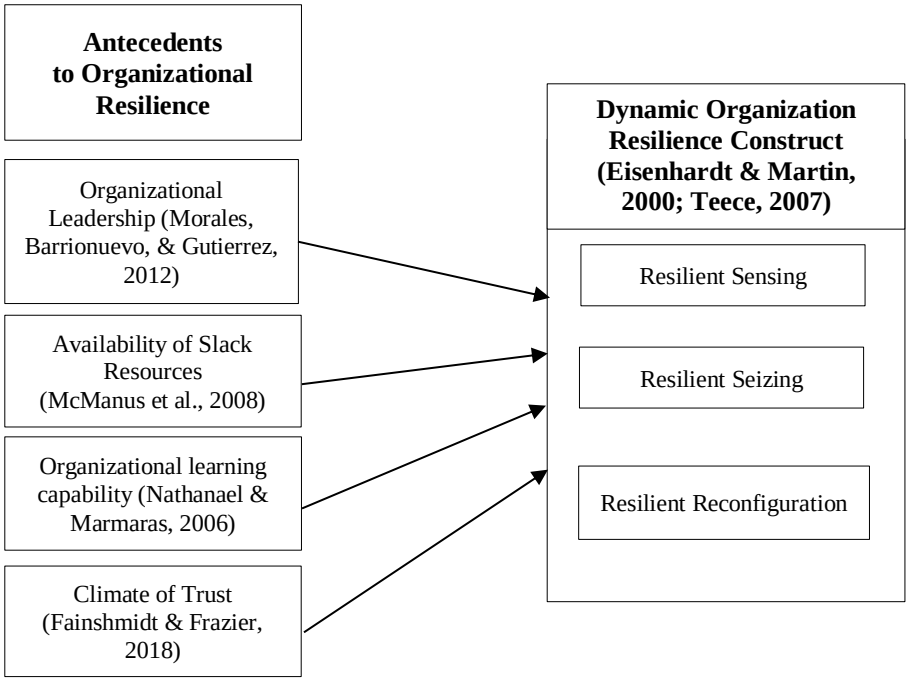

Figure 1. Proposed theoretical framework of organizational resilience

5. Conclusion

Organizations are complex in terms of their processes, dynamic in terms of their behavior, a system of closely interrelated organisms that function receptively to external interference, a chaotic system of various functions that changes according to the given conditions. Truly, developing an understanding of such a system requires a broader perspective which incorporates a multidimensional viewpoint. One way to understand such a system is to analyze it in terms of its resilient property, a capability of a chaotic system to bounce back in the face of adversity.

However, complex systems are difficult to understand and require a multidisciplinary approach for interpretation. Keeping in view, this paper has attempted to defined complex organizational systems in terms of their dynamic resilient capability to face uncertain environmental anomalies. A comprehensive review of literature within the fields of management science, socio-ecology, technology management, resilient engineering, economy and public policy has been conducted with the aim to develop a synthesis and to explore the factors of organizational resilience.

6. Future Implications

Unfortunately, an effort to develop organizational resilience has not been an explicit goal of strategic management. This study advances the theory of organizational resilience by proposing a conceptual model of dynamic organizational resilience capability by incorporating the domain of dynamic capability view. However, future empirical studies can focus on validating the construct of organizational resilience and study its relationships with proposed antecedent factors. Furthermore, the proposed dynamic model of organizational resilience can be revisited within the area of small and medium enterprises (SMEs), since several contextual and structural level factors associated with SMEs are unique and different from larger corporations (Pal, Torstensson, & Mattila, 2014). Hence, it will be interesting to study the mechanism through which SMEs can develop higher levels of dynamic resilience capability.

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