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THE TRINITY OF RESILIENT ORGANIZATION: ALIGNING PERFORMANCE MANAGEMENT WITH ORGANIZATIONAL CULTURE AND STRATEGY FORMATION

Tor Tangenes
BI Norwegian School of Business
tor.tangenes@bi.no

Riana Steen
BI Norwegian School of Business
riana.steen@bi.no

Abstract

In this work, we argue that resilience, as the fundamental quality needed to prosper from significant change that disrupts an organization's expected patterns of events, depends on the organization's culture, strategy content and formation, and performance management systems. Thus, it is thought-provoking that research in the field of performance management is largely disconnected from the adjoining fields of culture, strategy formation, and safety management. By discussing features of and connections between organizational culture and strategy formation for resilient organization, we provide a platform on which a performance management framework is developed. Vital in this respect is an organization's ability to address the factual, potential, actual, and critical. On the one hand, our work aspires to shed light on and bring research attention to the trinity of organizational culture, strategy formation, and performance management. On the other, our suggested resilient performance management framework contributes to make the concept of resilience operational.

1 INTRODUCTION

A resilient organization has the fundamental ability to respond productively to significant change that disrupts the expected pattern of events without undergoing an extended period of regressive behavior (Sutcliffe & Vogus, 2003, p. 3). An organization's ability to act resiliently depends on its performance management (PM) systems, in addition to its organizational culture and strategy formation (Steen & Tangenes, 2016). This is the trinity of resilient organization, which is the focus of this paper.

As an abstraction of firm decisions and actions, strategy formation is interwoven with organizational culture because it affects the ability of an organization to learn from experience and respond productively to disruptions and change (e.g., Everly, 2011; Mintzberg, 1978; Weick & Sutcliffe, 2001). Both organizational culture and strategy content can be condensed to hypotheses of cause and effect that provide behavioral guidelines for organizational actions in the quest for competitive advantage and goal achievement. PM systems, on the other hand, comprise planning and control mechanisms, which are designed to reduce the uncertainties in strategy content, increase content quality, adjust strategy content, and occasionally discard strategic initiatives or existing strategy (Gjønnes & Tangenes, 2014, p. 45). Moreover, PM contributes tools to control organizational behavior in accordance with firm objectives and goals. Under uncertainty, the classical approaches to strategic planning and controls can be dangerous (Courtney et al., 1997) and companies need to look at how they manage when strategy no longer provides adequate guidelines for action (Välinkangas, 2010).

This work takes a close look at the core ideas of resilience engineering (RE), which addresses changes in socio-technical systems, centering on identification, comprehension, and management of uncertainty. We focus on the understanding of resilience as a concept and its association with organizational culture, strategy formation, and PM. The three research questions addressed are:

- What are the main characteristics of organizational culture for resilient organization?
- What is a suitable strategy formation for resilient organization?
- How should performance management be structured and performance management tools be used to support resilient organization?

As to the first question, we base our discussion on the concept of generative organizational culture, and identify features that support learning, anticipation, response, and learning. With respect to strategy formation, we comment on the two prevailing formation templates discussed in the literature, rational planning and logical incrementalism (Elbanna, 2006), and discuss how a shift to the Bower-Burgelman (B-B) process can support resilient organization. Moreover, we discuss how implied learning imperfections of the B-B process can be mended through the attention-based view (Ocasio, 1997). In answering the third research question, we present a performance management framework which consists of seven steps: strategy formulation, operationalization, strategy implementation, uncertainty analysis, performance analyses, strategy adjustment impetus, and integrative and learning-based use of performance management tools. We emphasize the role of uncertainty analyses.

Based on insights from foundational works on resilience engineering, organizational learning, and strategy formation, we study core ideas and interrelationships. BIBSYS and the related library search system Oria, including full-text databases such as Business Source Complete, were used to select relevant literature for this study.

This work's contribution to the existing literature is at least threefold. First, while relations among strategy formation, culture, and learning are thoroughly debated in the literature (e.g., Mintzberg, 1994, 1987; Weick, 2000), PM is rarely studied in conjunction with these organizational foundations (Berry et al., 2009; Langfield-Smith, 1997, 2007; Malmi & Brown, 2008; Marginson, 2002). Despite a substantial amount of research in the PM field, the frameworks do not provide sufficient support for decision making in highly uncertain business environments (e.g., Buckingham & Goodall, 2015; Ferreria, 2002; Ottley, 1999). To do so, insights from the resilience literature should be considered. Second, the strategy and PM literature emphasizes top-down, rather than bottom-up formations (Bower & Gilbert, 2005), which triggers planning and control mechanisms that hamper resilience (Steen & Tangenes, 2016). Because the distinction between deliberate and emergent strategy is not controversial and empirically well documented, resilience-seeking organizations should "reinvent strategy making as an emergent process… [to]… reinvent management and make it more relevant to a volatile world" (Hamel, 2009, pp. 91, 94). The adjoined study of organizational culture, strategy formation, and PM from a resilience perspective is one contribution to this endeavor. Third, the concept of resilience engineering is criticized for being theoretical rather than

operational. Thus, a formalization of the concept is called for to make the concept applicable (Reghezza-Zitt, 2012). By linking resilience engineering to the instrumentalism of PM, we seek to contribute to an increased practical relevance of the concept.

The paper proceeds as follows: Section 2 provides a clarification of the resilience concept, from which we, in section 3, extract characteristics of a resilient organizational culture. In section 4, we scrutinize three prevalent strategy formation templates with respect to support of a resilient organization. In section 5, we discuss the components, structure, and use of a resilient performance management framework, whereas section 6 concludes and provides recommendations for further research.

2 THE RESILIENCE CONCEPT

In 1818, Thomas Tredgold introduced the notion of resilience to the English language from the Latin verb "resilire," meaning to rebound or recoil. In the economics field, Scott (1930) used the following metaphor to explain economic resiliency:

> …if we think of the boxer who has been floored in the ring. The boxer has a certain resiliency which enables him to resume after a shorter or longer time which is determined partly by his physique and determination, partly by the amount of punishment he has already received. In a somewhat similar way there is what may be called economic resiliency which after a crisis endeavors to recover from the series of shocks which industry and commerce have experienced…

The concept of resilience has been expanded and used in different scientific fields over the past decades, including ecology (Walker et al., 2002), metallurgy (Callister, 2003), individual and organizational psychology (Barnett & Pratt, 2000; Powley, 2009), supply chain management (Ponis & Koronis, 2012; Sheffi, 2005), organization theory (Hamel & Valikangas, 2003), safety management (Hollnagel et al., 2006), and performance management (Steen & Tangenes, 2016). Some of the suggested definitions of resilience in various scientific fields are:

- In psychology: The process of adapting well in the face of adversity, trauma, tragedy, threats, or significant sources of stress. It means "bouncing back" from difficult experiences (American Psychological Association).

- In ecological systems: The measure of persistence of systems and the ability to absorb change and disturbance and still maintain the same relationships between state variables (Holling, 1973, p. 14).
- In organizational theory: The fundamental quality to respond productively to significant change that disrupts the expected pattern of events without introducing an extended period of regressive behavior (Sutcliffe &Vogus, 2003, p. 3).
- In socio-ecological systems: The potential of a system to remain in a particular configuration and to maintain its feedback and functions; it involves the ability of the system to reorganize following disturbance-driven change. In an operational sense, resilience should be considered in a specific context (Walker et al., 2002, p. 6).
- In safety management: The ability of a system to adjust its functioning prior to or following changes and disturbances so that it can sustain operations after a major mishap or in the presence of continuous change (Hollnagel, 2007).
- In performance management: The *learning*-driven formal and informal mechanisms that *anticipate* potential opportunities and threats, *respond* adequately to internal and external disturbances, and *monitor* critical success variables to manage organizational behavior, sustain operations, recover from disturbances, and exploit and explore opportunities to build a desirable future (Steen & Tangenes, 2016).

Adaptive capacity is an aspect of resilience that reflects learning, flexibility to experiment and adopt novel solutions, and development of generalized responses to broad classes of challenges (Walker et al., 2002, p. 6). Moreover, to be resilient, it is crucial to bring in different and fresh perspectives on problems, keep discussion of risk alive even when everything looks safe, and avoid considering past success as a guarantee of future achievements (Dekker et al., 2008).

The goal of resilience engineering is to bring resilience to a system by assessing and enhancing an organization's ability to meet challenges. RE focuses on the organization's ability to cope with and recover from unexpected developments (Nemeth et al., 2009, p. 2). Steen and Aven (2011) defined resilience engineering (management) as all measures and activities carried out to manage resilience (normally increase resilience). As seen in Figure 1, these measures and activities can be influenced by a number of internal and external factors,

including resources, level of competence, management attitude, business model, and market structure (Ocasio 1997).

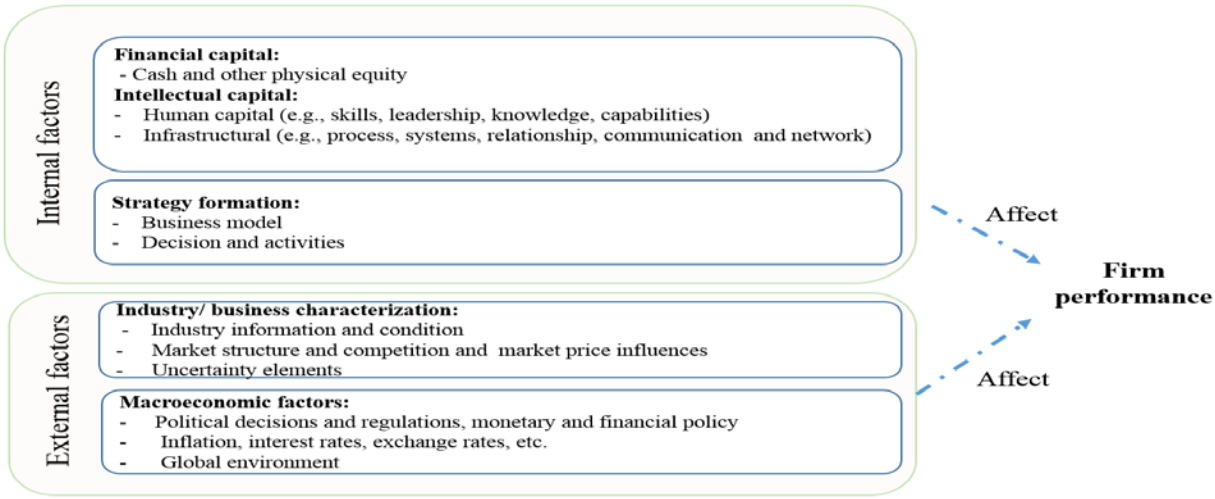

Figure 1. Internal and external factors that affect firm performance.

To be resilient, a system or organization must meet the four criteria (Hollnagel et al., 2011, p. 279) of learn, anticipate, respond, and monitor (LARM) (Steen & Tangenes, 2016):

1. Knowing what has happened, that is, how to *learn* from experience. This is the ability to address the factual.
2. Knowing what to expect, that is, how to *anticipate* future developments, threats, and opportunities, such as potential changes, disruptions, pressures, and their consequences. This is the ability to address the potential.
3. Knowing what to do, that is, how to *respond* to regular and irregular disruptions and disturbances. This is the ability to address the actual.
4. Knowing what to look for, that is, how to *monitor* that which is or can become a threat in the near term. This is the ability to address the critical.

Nemeth et al. (2009, p. 6) used the terms preparation and restoration as two phases in the engineering of resilience in an organization. The preparation phase incorporates all that precedes a challenge, from an organization's structure and ability to adapt and reconfigure to knowing whether resources can be identified, made available, and defended. The restoration phase includes activities following the wake of an event, such as recovery, reorganization, rebuilding, and learning lessons for the future.

3 ORGANIZATIONAL CULTURE FOR RESILIENT ORGANIZATION

Culture is a complex term that has a central role in governing and understanding behavior, social events, institutions, and processes. It is an invisible, heavy hand, built on practices

(Weick & Sutcliffe, 2011, p. 137). It has a significant impact on how organizations function, from strategic change through everyday leadership and how managers and employees relate to and interact with customers to how knowledge is created, shared, maintained, and utilized (Alvesson, 2002, p. 4). Our definition of organizational culture is consistent with Bang (2013). It is a set of shared norms, values, rules, standards, symbols, meaning, expressions, common consciousness, and behavioral patterns that develop in an organization. Organizational culture dictates how organizational members interact with each other and their environment. It is considered both an obstacle to and a facilitator of organizational change (e.g., Aguirre et al., 2013; Hanson & Melnyk, 2014).

The concept of generative organizational culture (Westrum, 1999) relates nicely to the resilience perspective. It encourages people in an organization to speak up (respond), think outside the box (anticipate), and act as fully conscious participants in a great cooperative enterprise (respond and learn). A generative culture provides a good information flow (monitor) and encourages cooperative and mission-enhancing behavior, such as problem solving, innovation, and inter-departmental bridging (respond and learn). Although organizational learning is closely related to resilience, a distinction exists between a culture of learning and a culture of resilience. While the former is about contingencies, exceptions, unintended consequences of one's own work, improvising, ongoing variations, and enactment of micro-level changes (Weick, 2000, p. 226), the latter manifests as a form of "psychological immunity" to unfortunate effects of adversity (Everly, 2011, p. 109). However, insight into organizational learning is a key to understanding resilience (Hollnagel et al., 2014). Moreover, for a given organization, organizational culture become manifest in its strategic orientation (Ren & Guo, 2011). However, cultural resiliency is a rich concept, some of whose important properties are summarized in Table 1.

Table 1. *Cultural resilience and LARM.*

LARM features	**Description: Underlying values, rules, standards, symbols, meaning, expressions, and common consciousness**
Learn	- Make sense of the organization's environment to act on what is sensed, and thus partly create it (Weick, 1995). - Share information associated with error reporting and organizational performance. - Search for detail taps and promote individuals' ability to ask questions and be attentive to details in safety-critical situations (HSE Report, 2011). - Ensure role clarity to improve individuals' understanding of both their own as well as colleagues' responsibilities in assuring safe performance (HSE Report, 2011). - Do not take past success as a guarantee of future success (Dekker et al., 2008).
Anticipate and monitor	- Think outside the box (Westrum, 1999). - Bring in different and fresh perspectives on problems (Dekker et al., 2008).

	- Listen to minority viewpoints, invite doubt, and stay curious and open-minded, complexly sensitized (Argyris, 1977; Westrum, 1999). - Encourage organizational members to speak up. - Keep discussion of risk alive even when everything looks safe (Dekker et al., 2008). - Utilize personal social networks of stakeholders to spread information and influence. - Stimulate collective mindfulness: Employees are vigilant, attend carefully, and are engaged in their work tasks (Weick & Sutcliffe, 2001). - Use intuition and make sense of the working environment. - Arrange for good communication channels and flows (i.e., the extent to which knowledge of events "flows upward" in the organizational hierarchy) (HSE Report, 2011).
Respond	- Provide leadership that sets priorities, allocate resources, and make commitments to establish organizational resilience throughout the firm (Bell, 2002). - Top management is willing to listen to strategic initiatives and support autonomous strategic initiatives according to real option reasoning (Barnett, 2008). - Act as fully conscious participants in a great cooperative enterprise. - Devolve decision-making power (Hope & Fraser, 2003). - Respond according to principles of empowerment, purpose, trust, and accountability (Bell, 2002). - Build a culture in which everything is everybody's concern. - Provide effective standardized procedures for key maintenance, testing, and operational activities (HSE Report, 2011). - Assess the extent to which organizations tolerate self-centered, risky behavior (HSE Report, 2011). - Ensure that management of change is addressed effectively and includes organizational, procedural, and technological changes (MIIB Report, 2008).

Moreover, the concept of collective mindfulness (Weick & Sutcliffe, 2001) also sheds light on the resilience perspective of organizational culture through its preoccupation with failure in the sense of early search for failure points, sensitivity to operations, reluctance toward simplifications, deference to expertise, and commitment to resilience. As a common organizational consciousness and a behavioral pattern (Bang, 2013), organizational culture affects decisions, actions, and strategic change through the presence or absence of LARM capabilities.

Learning organizations highlight continuous improvements and transformations (Prewitt, 2003) and are "…skilled at creating, acquiring, and transferring knowledge, and at modifying its behavior to reflect new knowledge and insights" (Garvin, 1993, p. 80). For the same reason, "…it is continuously expanding its ability to create its future" (Senge, 1990, p. 14), rather than passively adapting to changing conditions. Weick (1995) argued that management is occupied with the process of imposing sense on past experience. As employees experiment with the everyday contingencies, breakdowns, exceptions, and unintended consequences of

their work, they improvise, produce ongoing variations, and enact micro-level changes (Weick, 2000, p. 226).

Before we leave the cultural layer of resilient organization and move on to strategy formation, we return to the trinity of resilient organization. The outside layer in Figure 2 extracts the essence of a resilient organizational culture from a LARM point of view. Moreover, the middle and inside layer for LARM essentials is discussed in sections 4 and 5.

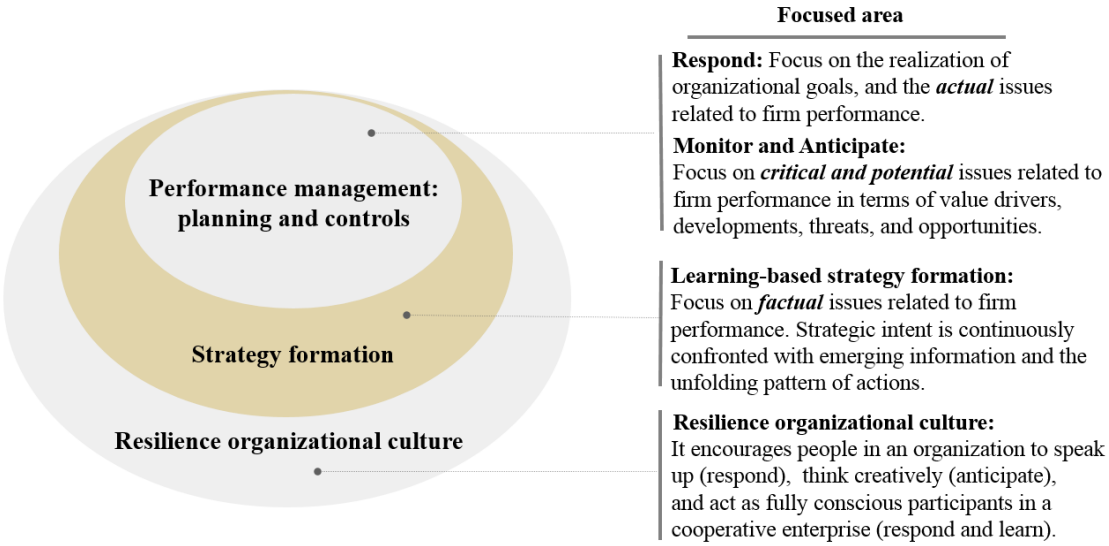

Figure 2. The trinity of resilient organization and its connection to LARM.

4 A LEARNING-BASED STRATEGY FORMATION

In this section, we discuss how a shift from rational planning to the B-B process can support resilient organization. We concentrate our investigation on the B-B process and on further developments of this model. The B-B process is a conspicuous, descriptive, bottom-up model of strategy formation and a possible template for resilient organization. Furthermore, we comment at the start on rational planning and logical incrementalism, which are the two prevailing templates discussed in the literature (Elbanna, 2006). Together, these templates relate to a variety of LARM-relevant features such as organizational devolution, origin of strategic initiatives, and management's roles in strategy making.

In defining strategy formation (strategic change) as "…judgmental designing, intuitive visioning, and emergent learning…," Mintzberg et al. (2003, p. 28) depicted the strategic process between the two extremes of deliberate and emergent change. We argue that the

engagement of different organizational layers in strategy making is imperative for resilient organization because it relates directly to features captured by LARM. Facilitation of organizational learning is an essential property in this respect. Expanding this proposition, one can claim that learning from the factual is a necessary condition for anticipating the potential, responding to the actual, and monitoring the critical. The rationale is straightforward: The absence of information on what has happened hampers the required adjustments and changes in strategy content and, thus, distorts an organization's expectations, decisions, and business intelligence. For this reason, any strategy formation that incapacitates organizational learning obstructs LARM and is unharmonious with resilient organization. Thus, our investigation is approached through the lens of organizational learning.

Rational planning prescribes a top-down, formal, analytical, and sequential strategy process in which middle managers' contribution to strategy formation is restricted to strategy implementation by aiding information flows from top executives to frontline managers (e.g., Andrews, 1971). However, rational planning and implementation of deliberate strategy are problematic in a complex and unstable world, among other reasons because of limited foresight, ignorance of key contingencies and capabilities on the front line (Weick, 2000), and, above all, obstruction of organizational learning (Mintzberg, 1998, p. 71), organizational flexibility, exploration, and change. "The more clearly articulated the strategy, the greater resistance to change – due to development of both psychological and organizational momentum" (Mintzberg, 1994, p. 175).

The linear structure of rational planning – thinking before acting – collides with the idea of double-loop learning (Argyris, 1976, 1977; Argyris & Schön, 1978). In a strategy formation context, double-loop learning and controls denote organizational capabilities to continuously question and assess the validity of strategy content, which implies cybernetic controls beyond deviations from intended strategy. Argyris (1976, p. 369) suggested a strategy formation that invites confrontation of one another's views about strategy content to achieve a position that is based on the most complete and valid information possible. "In the double-loop model, the unilateral control that usually accompanies advocacy [and rational planning] is rejected because the typical purpose of advocacy is to win" (Argyris, 1976, p. 369). Embedded in double-loop learning are exposure of errors and continuous monitoring of the effectiveness of decisions.

Logical incrementalism (Quinn, 1980, 1982) describes an incremental recognition process, where top management develops a phase-divided game plan for full realization of the business' vision without announcing radical goals. Observations from large, successful companies have revealed that planning does not describe how top executives formulate strategies (Quinn, 1980, p. 15). On the contrary, top management arrives at its goals through incremental "muddling" processes, where powerful, politically astute, and effective management practices replace rational planning. With respect to organizational learning, Quinn (1980) described logical incrementalism ambiguously (Mintzberg, 1998, p. 192). One interpretation opens up for organizational learning at the top management level by a vision incrementally developed. Another describes this formation as political and tactical maneuvering to implement a vision already developed. However, the top-down, strategic decision structure of both interpretations is inconsistent with a learning climate comprising experimentation, risk taking, collaborative inquiry, dialogue, and sharing of feedback, knowledge, and ideas. The learning organization is conspicuous by such characteristics (Snell, 2007).

Grounded on a large field-based study of strategic planning and capital investment in large, diversified companies, Bower (1970) proposed a process model of multilevel managerial activities that shape strategy formation. Burgelman (1983a) extended this model in a clinical study of internal corporate venturing in large companies. The result, known as the B-B model, suggests that strategic initiatives emerge mainly from the activities of front-line managers and then compete for top management's attention and corporate resources. As a bottom-up model that synthesizes deliberate and emergent strategy, the B-B process model of strategy making combines intended strategy with induced (exploitation) and autonomous (exploration) strategic initiatives and behavior. The model's fundamentals are:

- Definition, which is "…a cognitive process in which technological and market forces, initially ill defined, are communicated to the organization, and strategic initiatives are developed primarily by front-line managers who usually have specific knowledge on technology and are closer to the market…" (Noda & Bower, 1996, p. 160).
- Impetus, which is "…a largely sociopolitical process by which these strategic initiatives are continuously championed by front-line managers, and are adopted and brokered by middle managers…" (Noda & Bower, 1996, p. 160).
- Structural context determination, which "… reflects the efforts of corporate management to fine-tune the selective effects of the administrative arrangements so as to keep (or bring) the strategic proposal generating process in line with the current concept of strategy" (Burgelman, 1983b, p. 66).

- Strategic context determination, which "… refers to the political process through which middle-level managers attempt to convince top management that the current concept of strategy needs to be changed so as to accommodate successful new ventures" (Burgelman, 1983a, p. 237).

Definition, impetus, and strategic context determination are largely bottom-up processes, initiated at the front-line and middle-management level. On the other hand, structural context determination is a top-down process, which over time tends to make structural elements such as recruitment policy, project screening criteria, and performance measures harmonious with the current strategy (Burgelman, 1983b, p. 66). Thus, the extent to which strategic renewal through autonomous strategic behavior may be sufficient to cope with turbulent environments depends on middle managers' ability to activate the process of strategy context determination. Additionally, it depends on the social, economic, and cultural structures in the organization that govern the allocation of their time, effort, and attentional focus (March & Olsen, 1976; Ocasio, 1997). Specifically, the B-B process has the following latent deficiencies with respect to resilient organization, which are interconnected:

- Limitation of managerial attention: The number of initiatives championed is constrained by limited time and attention and by risk of losing reputation (Ashford et al., 1998).
- Restriction in evolution of new ideas: "…[The] care and feeding of new ideas cannot be left to an internal competitive process that resembles the functioning of markets" (Mintzberg, 1998, p. 199).
- Shortfall for disruptive innovation: The B-B process appears to be inadequate for disruptive innovation due to structural context inertia. Disruptive innovations require change in performance metrics and business models (Sorli & Stokic, 2009, pp. 109-110).

The attention-based view (ABV) of the firm may provide insights to suppress structural and behavioral limitations of the B-B process with respect to resilient organization. The ABV (e.g., Cyert & March, 1963; Ocasio, 1997) states that firm behavior is understood by explaining how firms distribute and regulate the attention of their decision makers. From an ABV perspective, strategy can be seen "…as a pattern of organizational attention on a particular set of issues, problems, opportunities, and threats, and on a particular set of skills, routines, program, projects, and procedures" (Ocasio, 1997, p. 188). Moreover, whether and how an organization adapts to a changing environment depends on specific contingencies ascending from its attention structure (Ocasio, 1997, p. 202), which is the social, economic,

and cultural structures that govern the allocation of time, effort, and attentional focus of organizational decision makers in their decision-making activities (March & Olsen, 1976). For instance, in the case of an externally (internally) oriented attention structure, managers are more likely to behave strategically with autonomy (induced) (Floyd & Wooldridge, 1992).

An organization's attention structure, which is affected by internal and external factors, depicted in Figure 1, affects middle managers' attention to innovation and change through so-called attention regulators (Ren & Guo, 2011). One important regulator is the "rules of the game" (Ocasio, 1997, pp. 196-198), which relate to organizational culture, strategy orientation, and formal and informal principles of action, interaction, and interpretation that guide organizational behavior. Principles of action, interaction, and interpretation include the design and use of performance management systems, which we elaborate in section 5. Generally, we suggest that resilient organization necessitates that the rules of the game are tuned in accordance with our LARM requirements. This includes a willingness to take on more risky projects on a continuous basis (anticipate and respond), abandon failing projects before significant investments have been made (monitor, learn, and respond), decrease the stigma of failing projects (respond), and make action more attractive than passivity (respond) (Barnett, 2008).

5 PERFORMANCE MANAGEMENT FOR RESILIENT ORGANIZATION

5.1 Performance management and strategy formation

Performance management involves ensuring that organizational behavior and decisions are aligned with key objectives and goals and, thus, strategy content. PM systems include supportive mechanisms for strategy development, implementation, and review, management by objectives, performance measures, and personnel appraisal (e.g., Ferreira & Otley, 2009). They comprise planning and control mechanisms which are designed to reduce the uncertainty in strategy content, increase content quality, adjust strategy content, and occasionally discard strategic initiatives or existing strategy (Gjønnes & Tangenes, 2014, p. 45). The terms PM and management control are used interchangeably in the literature. Ferreira and Otley (2009) claimed that the term management control has become a more restrictive term than was originally intended and that PM is used as a more general word to capture a holistic approach to the management of organizational performance. In the spirit of

Ferreira and Otley (2009), we use PM in this paper, with the exception of references to literature where management control is used.

Definitions of PM relate the term, explicitly or implicitly, to strategy content and process, planning activities, various kinds of controls, and/or reward and compensation (e.g., Ferreira & Otley, 2009; Malmi & Brown, 2008; Simons, 1995). At least two schools of thought exist with respect to PM's relation to strategy process:

- A clear distinction exists between strategy formulation and strategy implementation (e.g., Kaplan & Norton, 1992; Malmi & Brown, 2008; Merchant & Van der Stede, 2007). Here, the term strategic control refers to mechanisms that initiate and evaluate strategic change (strategy formulation), whereas management control relates to control mechanisms for the implementation of intended strategy (Gjønnes & Tangenes, 2009).
- Strategy formation is acknowledged as an interwoven process of formulation and implementation (Mintzberg et al., 1998, p. 207; Weick, 2000, p. 227; Ferreira & Otly, 2009). Thus, PM incorporates systems for strategy formulation and implementation.

Malmi and Brown's (2008) definition of management control is one of many that link management control to strategy implementation by considering firm objectives and strategy as exogenous variables:

> Management controls include all the devices and systems managers use to ensure that the behaviors and decisions of their employees are consistent with the organization's objectives and strategies, but they exclude pure decision-support systems. Any system, such as budgeting or a strategy scorecard, can be categorized as an MCS [management control system] (Malmi & Brown, 2008, pp. 290-291).

Fereirra and Otley (2009), on the other hand, defined PM systems in line with the latter view above by relating the term to strategy process, which includes both formulation and implementation. Moreover, their definition assimilates organizational learning and change. According to Fereirra and Otley, PM systems are:

> …the evolving formal and informal mechanisms, processes, systems, and networks used by organizations to convey the key objectives and goals elicited by management, to assist the strategic process and ongoing management through analysis, planning, measurement, control, rewarding, and broadly managing performance, and to support and facilitate organizational learning and change (2009, p. 264).

Since the latter view mentioned above acknowledges the coexistence of intended and emergent strategy, which is, according to our discussion in section 4, a prerequisite for capitalizing fully on LARM attributes, we follow this line of reasoning in this paper.

5.2 Some critical remarks of current performance management research

PM research is criticized for its tendency to be fragmentary and its focus on specific mechanisms of planning and controls instead of application of a more complete and integrated approach to PM (Chenhall, 2003; Covaleski et al., 2003). Whereas definitions of PM link it to strategy formation (cf. Ferreira et al., 2009), the interplay between PM and strategy formation is a largely unexplored field (Langfield-Smith, 2007; Marginson, 2002; Berry et al., 2009). Moreover, the prevalent PM frameworks do not provide sufficient support for decision making in highly uncertain business environments (Steen & Tangenes, 2016). Specifically, such frameworks tend to have a top-down structure, which typically implies some sort of rational planning without taking uncertainty considerations explicitly into account. Furthermore, they appear to be detached from LARM attributes. The key premises of the resilience literature are environmental complexity and instability, disturbances, unexpected challenges, adversity, stress, reduced system functionality, and a need for continuous change on the individual and organizational level. Adversity, stress, and reduced functionalities typically relate to the treatment of uncertainty, which is not explicitly reflected in established performance management frameworks (Steen & Tangenes, 2016).

To overcome issues in PM research related to simplified and partial PM frameworks, Ferreira and Otley (2009) articulated and discussed 12 questions for a firm to answer when developing PM systems. The questions relate to (1) elaboration and communication of vision and mission, (2) identification and communication of factors central to the organization's future success, (3) the impact of organizational structure on PM systems, (4) strategies, plans, and activities to ensure success, (5) key performance measures, (6) level of performance needed, (7) processes to evaluate individual, group, and organizational performance, (8) rewards gained by achieving performance targets, (9) information networks to support PM systems, (10) type of information use of various control mechanisms at different organizational levels, (11) the impact on PM systems of the change dynamics of the organization and its environment, and (12) strength and coherence of links between the components of PM systems and the way they are used. Although organizational culture, strategy formation, and LARM features are not among the 12 issues listed above, Ferreira and

Otley (2009) commented on the relevance of culture, strategy formation, and organizational learning for PM system design. Under issue no. 10, the significance of organizational culture is narrowed to a reference to Broadbend and Laughlin (2009), who claimed that culture expressed through communicative and instrumental rationalities has a significant effect on PM system design. As for strategy formation, Ferreira and Otley's (2009) observations are more elaborate. Issue no. 9 (p. 273) addressing information flows, systems, and networks covers organizational learning in relation to PM, which comments on feedback and feed-forward information and, correspondently, on single- and double-loop learning. Issue no. 10 (p. 274), which concerns how information is used, focuses on Simon's (1995) "levers of control," in particular, on diagnostic and interactive use of control information.

5.3 Performance management for resilient organization

Our proposed resilient performance management (RPM) framework presupposes and is consistent with a resilient organizational culture, as discussed in section 3, and a learning-based strategy formation, as discussed in section 4. The strategic planning and control elements in Figure 3 (steps 1 to 7) are interlinked and interdependent. We suggest that a resilient organizational culture and a learning-based strategy formation encourage interaction between the PM elements shown in Figure 3 through LARM features "…in a dynamic process that attempts to reduce differences between the actual state and an intended or desired state" (Hollnagel et al., 2008, p. 67) of firm performance.

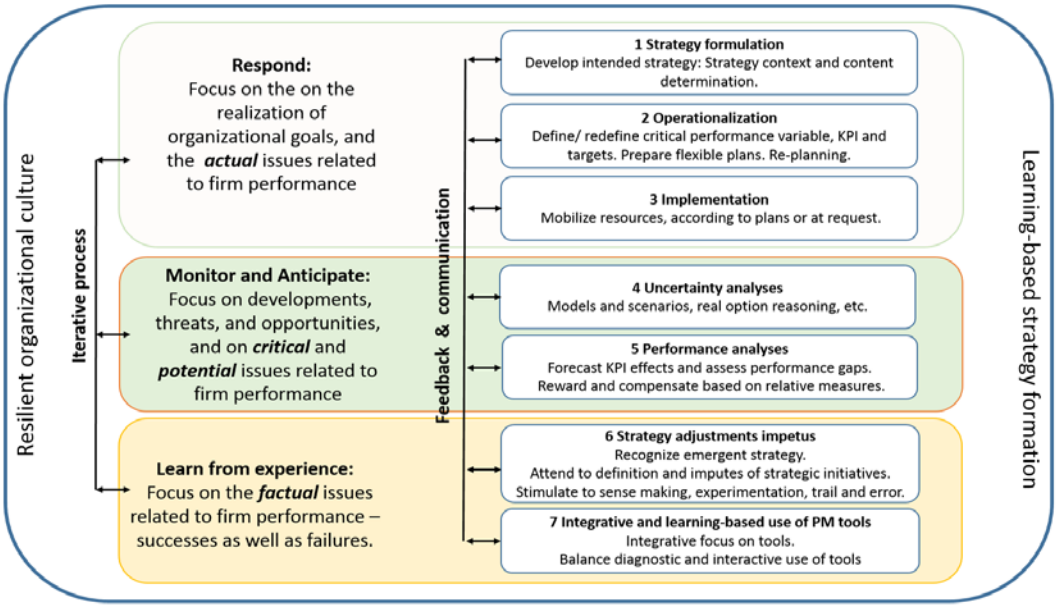

Figure 3. A performance management framework for resilient organization.

The Response Phase

The response phase in the RPM framework consists of three steps. Strategy formulation, as the first step, is a top management matter, based on the organization's mission and vision. However, strategic initiatives emerge in a bottom-up fashion – from front-line and middle managers – through processes of strategic and structural context determination to uncover the latent opportunities in the existing and potential resource base. The vision defines a desired future state of the firm and how that state can be reached (Penker & Eriksson, 2000). Strategy formulation includes determining the business scope and goals and provides the basis for corporate objective setting in terms of business portfolio and resource allocation (Collis & Rukstad, 2008). Moreover, strategy represents "… the more or less explicit articulation of the firm's theory about the basis for its past and current successes and failures (Burgelman, 1983c, p. 1350).

In step 2, we identify necessary conditions for achievement of strategic goals, termed critical success factors (CSFs). CSFs are mainly quantitative statements related to financial variables and qualitative statements related to non-financial variables (e.g., Kaplan & Norton, 1992, 1996). However, dysfunctional CSFs are prime obstacles for resiliency. CSFs are usually identified intuitively (Ittner & Larcker, 2003). A sealed focus on inappropriate CSFs diminishes the organization's capacity to monitor what is strategically critical and learn from what has happened. Thus, identification of irrelevant CSFs and the occurrence of casual fallacies when modeling relationships between CSFs can distort information (Ittner & Larcker, 2003; Nørreklit, 2000). Next, key performance indicators (KPIs) are measures for CSFs, and target values for the KPIs are identified and determined. In the case of a shortfall in either validity or reliability, KPIs are dysfunctional (Gjønnes & Tangenes, 2014, pp. 160-162) and hamper resiliency.

CSFs, KPIs, and targets provide direction for business plans. In practice, business planning and resource allocation are still largely centered on traditional budgeting (e.g., Ekholm & Wallin, 2000; Hansen et al., 2004; Libby & Lindsay, 2010). This situation, where budgets communicate business goals, obstructs responsibility, motivation, and improvements through organizational *learning* (e.g., Bogsnes, 2009; Hope & Fraser, 2003). Nevertheless, budgeting can contribute to organizational resilience when its roles are redefined (see Boing's budget practice in Horngren et al., 2012, p. 206). In the spirit of resiliency, Gjønnes and Tangenes (2014, p. 339) argued for budgets as forecasts to test for financial implications of business

plans. Thus, the budget does not communicate business goals and is not part of the business plan. Using the budget as a flexible forecasting tool can improve resilient organization.

The third and last step of the response phase is resource allocation and mobilization. In a traditional business approach, resources are tied to budgets, as opposed to a resource allocation on request, which would be the case in a learning-based strategy formation where bottom-up strategic initiatives compete for scarce corporate resources and top managers' attention (e.g., Noda & Bower, 1996). Notably, Statoil, the Norwegian oil and gas company, with NOK 623 billion in 2014 revenue from operations in 36 countries, has set aside traditional budgeting since 2005.

The anticipating and monitoring phase

The anticipating and monitoring phase points at possible changes in the business environment (see section 2), including developments, threats, and opportunities further into the future, disruptions, pressures, and their consequences. Knowing what to expect, and thus an organization's anticipating capacity, is restricted by management's limited attention. Attention-based works have shown that attention structures (see section 4) such as change in the "rules of game" (Ocasio, 1997, p. 196) and participation of "new players" (Ocasio, 1997, p. 197), affect the degree to which decision makers focus their attention on external or internal latent possibilities (Cho & Hambrick, 2006; Williams & Michell, 2004; Yu et al., 2005). Barnett (2008) proposed a positive association between organizations' externally (internally) oriented attention structure and their decision makers' likelihood of noticing latent possibilities in new (existing) markets (p. 613).

Step 4 in Figure 3 covers identification of opportunities in existing projects, as new information arises over time in combination with a range of uncertainty analyses. Consequently, flexible plans are modified or abandoned (step 2). Uncertainty analysis describes uncertainties through modeling the different aspects/factors/causes and propagates output effects (Zio & Aven, 2011). It provides insights into possible scenarios related to systematic and unsystematic shocks and their causes and consequences. Many different sources of uncertainty exist, including the subjectivity of analyst judgments when different analysts provide different interpretations of the same piece of information, depending on their cultural background and competence in the field of analysis. Lipshitz and Strauss (1997) linked the concept of uncertainty to three basic issues: outcomes, situation, and alternatives.

They also identified three basic sources of uncertainty: (1) incomplete information, (2) inadequate understanding when there are conflicting meanings of the issues at hand, and (3) homogeneous alternatives. Various techniques, tools, and checklists are used for screening uncertainty factors such as real option reasoning, brainstorming, models and scenario analyses, meta-analysis, and Delphi-type exercises. The Delphi technique is developed for use in judgment and forecasting situations, where pure model-based statistical methods are impractical or impossible. This is a procedure to obtain the most reliable consensus of a group of experts (Gunther, 2004).

Once the potential uncertainty factors are identified, it is important to convert them into measures, such as quantitative values like probabilities and confidence intervals or qualitative scoring such as critical, significant, moderate, or negligible, based on the existing knowledge and experiences, opinions, and judgment. In practice, some sort of likelihood and consequence criteria are frequently applied to express uncertainty (e.g., Steen, 2015).

Unlikely scenarios can emerge from the occurrence of unexpected uncertainty factors and impose significant economic loss on the firm. Responses to such scenarios should be considered. For this reason, we interlink the different phases (e.g., the link between the anticipating/monitoring and the response phase in Figure 1). In the response phase, intended strategies contingent on possible scenarios should be at hand. In this respect, it is important to improve the capability to cope with surprises, preparedness for adaptation, and avoidance of high vulnerability (Renn, 2005). Lipshitz and Strauss (1997) identified five strategies to cope with uncertainty (the RAWFS heuristic), which are reducing (gathering more information), assumption-based reasoning (filling in gaps), weighing pros and cons of competing alternatives, forestalling (anticipating undesirable consequences), and suppressing (rationalization). The results of uncertainty analyses can be used to assess the performance gaps and to forecast KPI effects (step 5).

Reward and compensation (step 5) is a wide-ranging discipline with branches to scientific fields such as economics, management, and leadership. A profound discussion of reward and compensation mechanisms is beyond the scope of this paper. However, we will briefly comment on two issues related to steps 1 and 2 in Figure 3. These are reward and compensation based on individual performance scores and budgets. With respect to the former issue, Kaplan and Norton (2008, pp. 149-151; 2001, pp. 253-271; 1996, pp. 217-222)

advocated subordinate employee scorecards to follow up individual performance and as a means for reward and compensation: “Ultimately, for the scorecard to create the cultural change, incentive compensation must be connected to achievement of scorecard objectives” (1996, p. 217). However, a substantial number of studies within the scientific fields of human resources and evidence-based leadership has documented that the practice promoted by Kaplan and Norton (2008, 1996) can be counter-effective (see Kuvås & Dysvik (2012) for an overview of this research).

A common corporate practice is to define budgets as part of business plans, which communicate financial goals, and includes the notion that achievement of budget goals triggers compensation (e.g., Ekholm & Wallin, 2000; Hansen et al., 2004; Libby & Lindsay, 2010). Such a practice implies a dubious idea of equality between budget achievement and value creation. This skepticism relies on two arguments. First, budget figures are negotiated and, thus, infected by tactical games (e.g., Hope & Fraser, 2003; Jensen, 2001; Wallander, 1999). Second, financial profit, as an empirical measure of the construct value creation, has generally low validity (Tangenes & Gjønnes, 2009). Moreover, the traditional practice, implied above, represents a command-and-control culture and tends to generate “spend it or lose it” behavior (Bogsnes, 2009; Hope & Fraser, 2003).

The learning phase

A resilient system learns from experience (Hollnagel, 2009 p. 148), which includes what is happening around us now, known as sense making, and learning from past successes and mishaps. Sense making involves turning circumstances into a situation that is comprehended explicitly in words and that serves as a springboard to action (Weick et al., 2005). Moreover, a resilient organization emerges because of its ability “to transition from one state to the next” (Sundström & Hollnagel, 2006, p. 243). The learning process is depicted as a “continuous planned process” in resilience engineering research studies (Becker et al., 2014, p. 6). In our PM model (see Figure 3), this process includes two steps – seek impulses to strategy adjustments and use PM tools to increase organizational learning. The former step includes recognition of the non-intended part of realized strategy, whereas the latter involves an integrative and balanced use of PM tool such as scorecards, budgets, and forecasts to achieve learning at all organizational levels.

One driver of emergent strategy is systematic shocks, which can impose a pattern of actions on a firm (Mintzberg & Waters, 1985, p. 258). Furthermore, learning organizations allow strategies to emerge after learning from experience and because of sense-making processes. Thus, emergent strategy is frequently the means by which deliberate strategy changes, by authorizing strategic initiatives in a bottom-up fashion (Mintzberg & Water, 1985, p. 271; Noda & Bower, 1996), which the B-B process, discussed in section 4, documents.

An integrative focus on PM tools contributes to learning through the provision of comprehensive, relevant, and timely information for decision making (e.g., Kaplan & Norton, 2008, p. 14; Olve & Wetter, 1999, p. 187). On the other hand, an interaction between diagnostic and interactive controls contributes to balancing the tension between unlimited opportunities and limited management attention and between implementation of intended strategy and strategy adjustment of change (Simons, 1995, p. 153).

Using PM tools to increase organizational learning requires a process of tool selection and integration, in which one should elucidate a number of issues (Gjønnes & Tangenes, 2014, p. 321). In this respect, the following questions are relevant:

- What role(s) (purposes of PM) should a selected PM tool fill?
- Is the role(s) relevant for performance management of resilient organization?
- If a PM tool fills more than one role, are the assigned roles mutually compatible?
- Is the PM tool in question suited for its assigned role(s)?
- Should specific tools be used diagnostically or interactively to support resilient organization?

Because there is an immoderate number of PM tools, we restrict our discussion to strategic PM systems, specifically Kaplan and Norton's (1992, 1996, 2008) balanced scorecard (BSC) and offensive forecasts (forecasts on variables susceptible to influence) of financial and non-financial variables for the following reasons. The BSC is a dominant strategic PM system, which is used by 66% of executives in large businesses worldwide (Rigby & Bilodeau, 2007) and, among others, by 35% of Fortune 5000 companies (Marr, 2005) and 45% of large businesses in India (Anand et al., 2005). Offensive forecasting is indispensable in the modern management literature (e.g., Morlidge & Players, 2010; Hope & Fraser, 2003) and should be

aligned with strategic PM systems to facilitate comprehensive information and contribute to organizational learning (Gjønnes & Tangenes, 2014).

In accordance with the five questions stated above, integrative use of BSC and forecasts requires role identification and separation. In this respect, the BSC is both "a set of measures that gives top managers a fast but comprehensive view of the business" (Kaplan & Norton, 1992, p. 71) and a tool that contributes to linking long-term strategic objectives with short-term actions (Kaplan & Norton, 1996, p. 75). Notably, the budget is a unified financial measurement system that can be used interactively, as opposed to its traditional diagnostic use (see Libby & Linsey, 2010, p. 60; Hansen et al., 2004, p. 423; Ekholm & Wallin, 2000, p. 527). Thus, it provides a set of financial forecasts to test financial implications of planned activities (Tangenes & Gjønnes, 2014). In doing so, budgets and plans are separated, and the budget matches plans with respect to time horizon, updates, and content. Moreover, forecasts on financial figures are insufficient for resilient organization. Expanding BSC to include KPI forecasts in addition to target values can balance the top-down, diagnostic approach of implementing intended strategy with the bottom-up, interactive approach of offensive forecasting (see Morlidge & Player, 2010). As for the balancing of diagnostic and interactive use of PM tools in general, this issue is well covered in Simon (1995).

In conclusion, in this section we discussed how seven different steps in our suggested framework can improve the resilience characteristics of an organization's performance management system. However, as Hollnagel (2014, p. 191) pointed out, the improvement and progress is "neither simple nor mechanical, it requires an overall strategy. It should be followed continuously so that any unanticipated development can be caught early on and addressed operationally."

6 CONCLUDING REMARKS

In our quest to shed light on resilient organization, we started by unfolding its landscape of culture, strategy, and PM. Organizational culture offers guidelines and opportunity space for *strategy formation*, whereas PM reduces the uncertainty of *strategy content* and facilitates content renewal. In the case of resilient organization, we suggest a generative culture that provides a good information flow and encourages cooperative and mission-enhancing behavior to support a bottom-up/top-down formation. Moreover, we recommend an iterative PM system where planning and control elements support learning from experience,

anticipation of opportunities and threats, monitoring of critical strategic elements of value creation, and timely response to signals from diagnostic and interactive controls.

According to the attention-based view, organization adaptation to a changing environment depends on its attention structure. Moreover, its strategy formation is seen as a pattern of attention on a particular set of issues and a particular set of resources. To learn from experience and focus on factual issues related to firm performance, we suggest a formation that captures induced and autonomous strategic behavior in a bottom-up fashion, where the "rules of the game" are consistent with the LARM requirements.

A formation that invites induced and autonomous strategic initiatives in a bottom-up fashion contests intended strategy on a continuous basis. To ensure a strategic focus on critical and potential issues related to firm performance in terms of value drivers, developments, threats, and opportunities, PM tools with well-defined and integrated roles should be used interactively as well as diagnostically. Moreover, coping with uncertainty leaves little room for top-down, linear planning in combination with traditional budgeting and management by exception. On the contrary, it entails good communication channels and bidirectional communication flows, supported by profound business intelligence, continuous measurements, forecasting, and evaluations of KPIs throughout the layers of value creation, flexible planning, iterative processes of controls, and a range of uncertainty analyses and risk assessments of induced and autonomous strategic initiatives.

The scarce amount of research on the conjunction of PM, on the one hand, and organizational culture, strategy formation, and safety management, on the other, calls for descriptive as well as normative and causal lines of research. Examples of research issues to be investigated include (1) further conceptualizing of resilient PM, (2) strategy formations across countries, industries, and business sizes, (3) culture – strategy formation – PM relationships, (4) associations between business performance and modes of PM, including frameworks of resilient PM, and (5) effect of resilient PM in response to disruptive change.

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