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The Impact of Environmental Turbulence on Organizational Learning

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Abstract

Organizational learning (OL) is an area of business study that is continually expanding and developing new methods for effectively responding to the dynamic and disruptive shifts that occur in the environment. Firms that are best able to envisage and interpret environmental shifts and then proactively position their organization through an effective system of OL will increase the probability of developing a source of competitive advantage. This advantage centers on the organizations ability to interpret the external data and apply this knowledge to the capabilities processes used by the organization. Through application of this knowledge, research has shown that enhanced organizational capabilities performance such as increasing the speed of fostering innovation, product/market creativity, knowledge application and transfer will occur, to name but a few, will occur.

As a firm's organizational learning process is influenced by and in many cases rooted in their responsiveness to the environmental turbulence, a reasonable extension of logic would be that the environment turbulence has an effect on the efficacy of organizational learning.

Properly designed and implemented organizational learning processes are key for organizations to assess the true level of environmental turbulence. Only by evaluating and responding to a properly assessed level of turbulence can the firm align their capabilities with their strategy. Therefore, in order to outperform the competitors, organizations will need to be more proactive in creating its "future by design" which requires more creative strategic "thinking" rather than "planning" in the rigid, traditional manner.

1. Introduction

Research has proven that the implementation of effective organizational learning into the decision-making process leads to better organizational performance. Lopez, Peon, and Ordas (2005) found that with higher level of performance in strategic decision practices, organizational learning contributes a positive influence on business performance. Morgan and Turnell (2003) demonstrated that when organizations showed more favorable learning values that it improved their market information processing behaviors and analytical capabilities. Their research was further able to demonstrate that the improved information processing and analytical capabilities directly impacted the market-based outcomes the organization was able to generate. Although firms profoundly rely on external knowledge to nourish creativity and innovation for better organizational performance, it is still a critical challenge to make the best use of the external knowledge for an organization's future strategic development (Cassiman & Veugelers, 2006).

Defining learning as the process by which knowledge is refreshed, the study of Yang, Wang, and Niu (2007) revealed that although applying organizational learning can significantly influence corporate performance, only high-tech and financial firms have consistently applied organizational learning processes throughout their organizations raising the question, why is it that service and manufacturing firms fall short of applying organizational learning.

2. Environmental Turbulence Defined

Ansoff and McDonnell (1990), define environmental turbulence as the combined measurement of the changeability, instability, and predictability which is reflected in the complexity and novelty of change in the environment. Gianos (2012) noted that Ansoff divided the environment into two basic categories: stable and discontinuous. In stable environments, "decisions about the future are based on past and present events that can be extrapolated into the future" (p. 109). Change is understood as incremental, predictable, and visible. In discontinuous environments, "the future is partially visible and predictable; therefore, change is possible by using weak signals from the environment" (p.109). Whereas discontinuous environments are defined by, change events occurring more rapidly than the firm is able to respond and the change events are novel and more frequent.

How the firm evaluates and determines clarity and completeness of the change events determines, in part, the firms strategic decision-making process (Emery & Trist, 1965; Ansoff & McDonnell, 1990). Specifically, Emery and Trist (1965) noted that although the future change events could be invisible and completely unpredictable, organizations base change by

evaluating and building upon scenarios utilizing weak environmental signals. The gathering of weak signals and the interpretation of such signals relies entirely on a well-developed organizational learning system.

2.1 Environment and its Turbulence

Ansoff (1972) defines the environment as "a set of elements and their relevant properties which elements are not parts of the system but a change in any of which can produce a change in the state of the system." Hence, the environment consists of "all variables which can affect its (the firm's) state". Duncan (1972) divides environment into internal and external components which are distinguished by the existences of the components inside or outside the organization. Duncan's position on the environment differs from Andrews (1971), Glueck (1980) and Miles (1980) who only focus on the external conditions and influences from the environment excluding the internal components.

The concept of turbulence was originally introduced in 1965 by Emery and Trist. They stated that the business environment is influenced by multiple component groups (competition, customers, suppliers, stockholders, general market, regulatory bodies, legislative bodies, technology, economy, and society) with different disruptive factors. Milliken (1987) defined environmental turbulence as the perceived inability of an organization to accurately and properly assess the influences presented by the external environment or the future changes caused by the external environment that may occur. Milliken's position is at odds with Ansoff as he presumes that the organization has limited options available to react to the changes in the turbulence level.

Kohli and Jaworski (1990) take a narrow position on turbulence, specifically identifying the causes of turbulence to market shifts, changing composition and preference of customers, and technological. Recommending that firms adjust their strategy based on the frequency and unpredictability of change in technology and/or market preferences.

Ansoff (1979) describes environmental turbulence is a function of changeability and predictability which in turn is the combination of changeability of the market environment, speed of change, intensity of competition, abundance of technology, discrimination by customers, and pressures from governments and influence groups. To be specific, changeability represents the novelty and speed of change in the business environment, and predictability evaluates the clarity and the capability of the firm's information dealing with changes for strategic decision-making.

Ansoff (1979) also developed the measurement of the environmental turbulence into five levels: repetitive, expanding, changing, discontinuous, and surprising levels (figure 1). Stating that when the environmental turbulence level shifts and becomes increasingly disruptive, firm's that match their strategic aggressiveness and supportive capabilities to the increased level of turbulence, have a higher strategic performance level than firms who fail to align strategy/capabilities the increased turbulence level, referring to this alignment as the firm's strategic posture.

Figure 1: Ansoff's Levels of Turbulence

Discontinuity	Complexity of the Environment	National Competitor w/ Economic Conditions	Plus	Global Regional Competitor w/ Technology effects	Plus	Global Competitor w/Social-Politcal effects
	Novelty of Change	No Change	Change is slow and incremental	Change occurs faster but still incremental	Change is discontinuous but an expected transition	Change is discontinuous but now completely unexpected
Unpredictability	Rapidity of Change	No Change	Change occurs slower than the firm can respond	Change occurs equal to the firms ability to respond	Change occurs more rapidly than the firm can respond	Change occurs catching the firm completely by surprise
	Visibility of Future Events	Complete visibility of future change events	Future change events are easy extrapolable	Future change events are predictable	Future change events become less predictable	Future change events are completely unpredictable
Instability	Frequency of Turbulence Level Shifts	No shifts due to no change	Low	Moderate	High	Multiple shifts per year
	Environmental Turbulence Level Scale	1 ⟷ 2 ⟷ 3 ⟷ 4 ⟷ 5				

How management responds to the environmental changes can be attributed to a number of factors such as organizational inertia, tradition, size, skills, management ambition, and capabilities of the organization.

Given this context, Ansoff and McDonnell (1990) caution between the perceived environment and the real environment. As such, it is critical for decision makers to recognize the differences between perceived and realize environmental turbulence. This distinction must be addressed between perception and reality in relation to organization capability, associated with factors such as culture, leadership, structure and resources (Thwaites & Glaister, 1992).

If the proper strategic decision is made, the management must ensure that the organization is configured in a manner that can support this decision. Thus, to optimize organizational performance, organizations need to carry out careful diagnosis and analysis of the environment in order to assess the levels of turbulence and then chose one appropriate mode of strategic behavior accordingly (Thwaites & Glaister, 1992).

3. Organizational Learning and its Nature

Organizational learning is often described as the result of knowledge acquisition, information distribution, information interpretation, and organizational memory. However, this simplified model is not able to explain the complexity of what organizational learning really is (Huber, 1991). History is replete with examples of researchers trying to assess and apply organizational learning by different approaches, concepts, and aspects; consequently, there have been various theories with different perspectives of organizational learning provided in literature.

In order to keep focus of this discussion, those arguable definitions of organizational learning proposed by researchers with different perspectives will not be comprehensively mentioned but only discussed in its dynamic nature specifically. Therefore, in this section, the characteristics of its nature will be brought to discuss.

There are several dimensions of the nature regarding organizational learning being discussed over time, such as if organizational learning involves multilevel framework. Multi-level framework includes all individuals, groups, and organizational level, the effects of which transfer from one level to others relating to cognition, insight, and innovation (Nonaka & Tekeuchi, 1995; Simon, 1991). From a strategic perspective, it is obvious that this learning transference when exactly shared, executed, developed, and institutionalized throughout the levels of the organization create advantages benefitting the organization's future competitive position (Crossan, et al., 1999, Argyris & Schon, 1996; Daft & Weick, 1984; Hedberg, 1981).

There are four learning processes and three different levels identified in organizational learning (figure 2). In the individual level, there are processes of intuiting and interpreting; in group level, there is a process of integrating; in the organization level, there is a process of institutionalizing (Crossan, et al., 1999). The four learning processes overlie the three levels and naturally flow and link from one into another. Intuiting is the recognition of the pattern and possibilities inherent in a personal stream of experience, and interpreting is explaining of an insight or idea from one to another through words or behavior. Integrating is the process of developing shared understanding among individuals and the process of taking coordinated action through mutual adjustment, and institutionalizing is the process of ensuring routines and actions accordingly within organizations.

Figure 2: Crossan's Learning and Renewal in Organizations

Individual	Process	Inputs/Outcomes
Individual	Intuiting	Experiences
		Images
		Metaphors
	Interpreting	Language
		Cognitive map
		Conversation/dialog
Group	Integrating	Shared understandings
		Mutual adjustment
		Interactive systems
Organization	Institutionalizing	Routines
		Diagnostic systems
		Rules and procedures

Organizational learning can be seen as one of the means of achieving the strategic renewal of an enterprise. March (1991) indicated that renewal requires the organization explore and learn new ways while simultaneously applying what they have already learned; therefore, strategic renewal should focus on the entire organization that operates in an open system rather than having a single internal focus (Duncan & Weiss, 1979). Based on March's suggestion, organizations should carefully manage the tension between exploration and exploitation by "maintaining an appropriate balance" due to they are both critical and essential for organizations' development but at the same time they "compete for scarce resources".

Recently, researchers found that the benefits and outcomes from learning strongly depend on the intensity of the environmental turbulence, for example, when the environment tends to be more stable, the outcome of organizational learning is likely to be more effective (Levinthal & March, 1993; Jansen, et al., 2006). Boyne and Meier (2009) also found that organizations in turbulent environments find it more difficult to perform well, noting "turbulence is bad for performance so steps should be taken to avoid it or minimize its effects" (p. 820). Still, Baba, Mahmood and Halipah (2017) found that organizational learning occurs at any level of environmental turbulence and has a positive effect on the organization's ability to innovate. Hannan and Freeman (1977) found that the benefits of stability may be, in part, contingent on whether the organization operates within a generalist or specialist category.

In their equilibrium model of positioning, Ander, Ruiz-Aliseda, and Zemsky (2016) examined firm positioning within an industry. Defining a specialist as a "cost leader" targeting the low-end segment and a "differentiator" targeting the high-end segment" (p. 184), their specialist classification corresponds to Porter's Generic Competitive Strategy model. Ander, Ruiz-Aliseda, and Zemsky (2016) characterize generalists as "able to target both segments and "hence have greater ability to exploit economies of scale" (p.184). Hannan and Freeman proposed that "faced with unstable environments, organizations ought to develop a generalist

structure that is not optimally adapted to any single environmental configuration but is optimal over an entire set of configurations" (p. 946).

4. Cognition Affects Action

The relationship between cognition and action is critical to organizational learning process because understanding leads to actions, and action also informs understanding simultaneously (Seely-Brown & Duguid, 1991), and this is the major difference between knowledge management and intellectual capital. This characteristic is also in relation to double-looping learning, which is the fundamental element of organizational learning.

By reviewing the nature of organizational learning, it is very obvious that organizational learning is actually a dynamic process. It occurs over time and cross-levels, and it also creates a tension between absorbing new learning and exploiting what has already been learned over time; it involves different levels and affects one to another when interacting, and its cognition process leads to action as well as the experience of action supports possible new cognition. Therefore, learning has been institutionalized and impacted among individual, group and organizational learning process, and with those characteristics in its nature, organizational learning becomes a constantly adaptive process so as to cope with the changing environment by enforcing organizations being able to sense changes proactively and to adapt accordingly.

5. The Impact of High Environmental Turbulence on Organizational Learning

Levinthal & March, 1993; Jansen, et al., 2006 posit that when the environment tends to be stable the outcome of organizational learning is likely to be more effective in return. Hanvanich et al. (2006) also implied that, if industries are segmented into different levels, relatively stable industries should be better able to establish long-term structures and process of organizational learning due to benefit from accumulated knowledge over time, and in comparably dynamic industries, instead of focusing on accumulated knowledge, a short-term, more profitable strategy would be to acquire skills and required resources that are both timely and adaptable in response to new changes.

However, their position is disputed by other researchers whose research proves that high levels of environmental turbulence does positively influence organizational learning. Freeman and Perez (1988) described that the disruptive changes in technologies cause considerable heightened environmental turbulence for firms and when faced with these shifts, they will positively respond to those disruptive changes. Elisenhardt and Martin (2000) also addressed the importance of the environment in analyzing the effect of capabilities in organizational

learning because different degrees of turbulent environments imply different valuations of dynamic capabilities. Srivastava and Frankwick (2011) found that the degree of environmental turbulence affects the way organizational learning takes place including the focus in attitude, intent, and receptivity toward OL by top management.

Further, empirical research conducted by Ansoff and Sullivan (1993) state that firms with an advance OL will continue to monitor the environment for signs of demand saturation, technology substitution, structural changes in consumer demand, social and political discontinuities, and assess the future inherent profitability and growth in their historical markets.

As such, organizational learning can be seen as the proactive response to the need to adjust for the greater uncertainty presented by the increased level of turbulence and has been responsible for the changing strategic direction in order to occupy a more competitive position (Pavitt, 1991; Dodgson, 1991).

6. Discussions

From the previous sections discussing organizational learning and environmental turbulence it can be concluded that they share one thing in common; both are dynamic by nature. Organizational learning is the dynamic process that is constantly adaptive to environmental changes based on the need for organizational growth which is stimulated by creating new or incrementally improved competitive advantages. Environment turbulence is dynamic by its combined measure of changeability, instability, and unpredictability and has a profound influence on the strategic decisions of an organization.

As such, the interaction between the two variables warrants a discussion. OL's focus is to exploit to the advantage of the organization, the data acquired from both the external environment and considering the internal capabilities of the firm. This transference is accomplished through interpreting, integrating, and institutionalizing, hence organizational learning. Ansoff refers to this process generally as Contingency theory, based on previous research by W. Ross Ashby (1957), which states that 'to successfully manage the output of a system, the number of control mechanisms required will correspond to the number of elements in that system'.

The rationale of Ansoff forms a foundation for deliberately responding to changing environments in different situations according to the organizations' capability and strategy, and by extension, what it has learned.

7. Conclusions

At the most basic level, firms chose between the competitive strategy of specializing their activities to serve specific market segments or broadening to become generalists that serve multiple market segments (Hannan & Freeman, 1993). The impact of environmental turbulence on organizational learning will add a new dimension to the classic debate regarding the relative attractiveness of generalist versus specialist strategies. Yet, irrespective of how a firm chooses to position itself within an industry, organizations will certainly need to focus on the interaction between changing environments and their ability to learn.

Properly designed and implemented organizational learning processes are key for organizations to assess the true level of environmental turbulence. Only by evaluating and responding to a properly assessed situation can the firm align their capabilities with their strategy. Therefore, in order to outperform the competitors, organizations certainly will need to be more proactive to create the "future by design" which requires more creative strategic "thinking" rather than "planning" in the rigid, traditional manner (McKenna, 1999; Stacey 1996).

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