

The Impact of Cybernetics on Organizational Learning: Then and Now

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Abstract

The purpose of this paper is to provide an overview of literature on organizational learning and cybernetics trying to answer how cybernetics impact organizational learning. The research method used relied heavily on revision, analysis, comparison beside related literature on organizational learning and cybernetics along with providing insights from COVID 19 crisis. Through a theoretical approach of reviewing organizational learning and cybernetics literature supported by most recent practical examples, this study shows how cybernetics offer organizational learning a framework of insights and measures to achieve its goals. Selection of theorists and related concepts were analysed in this paper; however a further study is needed, after the outbreak to assure the results.

Key words: single loop learning, double loop learning, Deutero learning, first order cybernetics, second order cybernetics, COVID-19

Introduction

In today's unstable and volatile world, doing business looks like competing in a heavyweight-boxing ring where winning or even surviving is not an easy mission to accomplish. Companies are experiencing turbulent and chaotic environment characterized by rapid technological changes, increased globalization, intensified geopolitical tensions, and economic instability. In addition to that, the recent pandemic COVID – 19 has vastly shaped the global business environment, shut down the worldwide economy, disrupted the way people live and hindered how workplaces operate around the globe.

While companies must have their antennas tuned and ready to detect these flooding signals, decode them and quickly act accordingly, reinvigorate or re-invent its business model, many of them are lost in the fog of uncertainty, trapped in their traditional approaches to strategy, and confined in their rigid organizational structure. Why? This is because while the existing challenges call for adaptability, learning, and creativity these organizations are non-learning

organizations that have developed a proficiency in ignorance.

Therefore, for those companies to survive they must be proactive, responsive, robust and resilient and their only chance to do so is by empowering or creating an organizational learning culture reinforced and empowered by a cybernetic mindset. A mindset that assesses crisis as a one for regulation, besides offering a framework for dealing with it not only from a therapeutic mode, yet from a preventive mode as well.

Chapter 1. Organizational Learning

The concept of organizational learning has been tackled almost 40 years ago. It was early mentioned by March and Simon in 1958 (Casey, 2005). However, with the vast global changes, technological revolution, and instability, this concept was of a major interest for consultants, leaders and many other parties besides scholars and theorists. According to Dodgson (1993), this concept provides insight to organizations facing an uncertain turbulent environment. However, for vast majority of theorists, organizational learning is a critical and non-ending process that unfolds with time. They mainly linked it with knowledge acquisition and its reflection on the organizational performance. Peter Singe even went further and mentioned boldly that “organizations suffering from severe learning disabilities will die before the age of forty”!

1.1 Organizational Learning – Meaning & Definitions

Surprisingly, even with the emerging importance of organizational learning, it is very elusive to find a clear and common definition for it among literatures.

According to Lundberg, “it seems to have little agreement on the definition, processes, and models in this field” (Lundberg, 1995). As an example for Simon (1991), Organizations do not learn, yet people do. According to him, “we must be careful about reifying the organization and talking about it as ‘knowing’ something or ‘learning’ something. All learning takes place inside individual human heads; an organization

learns in only two ways: (a) by the learning of its members, or (b) by ingesting new members who have knowledge the organization didn't previously have. While for Hedberg (1981), organizational learning "occurs through individuals and individual learning is important to organizational learning" however individuals don't represent the whole picture of it. According to him, "it would be a mistake to conclude that organizational learning is nothing but the cumulative result of their members' learning ... Organizations do not have brains, but they have cognitive systems and memories ... Members come and go, leadership changes, but organizations' memories preserve certain behaviours, mental maps, norms and values over time". His opinion intersected later on by Nonaka (1991), who described organizations as "a living organism with a collective sense of identity and a fundamental purpose, which in turn influences each member's commitment to learning and sharing knowledge. It is recognized that as members learn and codify their learnings in organizational features such as norms and systems, those features in turn influence future member learning". On other hand, Cyert and March (1992) defined organizational learning as "the creation of knowledge, the retention of knowledge, and the transfer of knowledge. Altogether can be conceptualized as formal activities which are a function of experience". While in Mayo's (1994) opinion, organizational learning "consists of all the methods, mechanics, and processes which are used in the organization in order to achieve learning. Learning is about action. It is about using the information that we gather to create knowledge management systems and statistical databases and then using that knowledge to improve the organization".

1.2 Organizational Learning from Different Approaches

While there are different approaches to study organizational learning; the major and most recognized approaches are cognitive and behavioural approach.

Theorists like Day and Freidlander considered learning pure cognitive. As said by Day (1994), organizational learning occurs without any need to change in behaviour; "it is a process of developing open-minded inquiry and informed interpretation". Same applies to

Freidlander (1983) who suggested, "Change resulting from learning need not be visibly behavioral. Learning may result in new and significant insights and awareness that dictate no behavioral change. In this sense, the crucial element in learning is that the organism be consciously aware of differences and alternatives and have consciously chosen one of these alternatives. The choice may not be to reconstruct behavior but, rather, to change one's cognitive maps or understandings" (Freidlander, 1983).

On the other hand, other theorists like Argyris, Stata and Alvani favored a dual cognitive – behavioral approach that believed in the necessity of cognitive development together with actions and behaviors to achieve complete learning. According to them, as discussed by Odor, "for learning to take place, both the belief system and the behavior, by way of action, must be involved" (Odor, 2018). Argyris (1977), related between them by defining organizational learning as "the extent to which an organization identifies and corrects error". Alvani confirmed Argyris opinion by defining organizational learning as "the process of finding errors and mistakes and resolving and correcting them" (Alvani, 2008). While Stata (1989) linked it with innovation suggesting, "It is a process by which individuals gain new knowledge and insights and thereby modify their behavior and actions".

1.3 Levels of Organizational learning

Upon examining in any organization, we can find three basic levels where organizational learning occurs: the individual level, the group level and the organizational level.

Individual level is the smallest level at which learning occurs. Generally, it is where individuals increase their knowledge, productivity and performance by learning new skills and ideas. Usually it is a process that starts by acquiring skills related to individual's environment, followed by understanding, interpreting then conducting experiment, and ended by adjusting behaviour based on the obtained results using conceptual and cognitive model. However, at this level it depends on the individuals' decision whether to share this knowledge or not and in many cases organizations lose this knowledge because individuals leave without sharing it.

Group level is the next level where individuals work together, cooperate, and share among others what they have learned at the individual level. However, some researchers shared a different understanding like Argyris (1995) who considered group learning a “process of error detection and correction” and Crossan, Lane and White (1999) that defined it as a “process of group interpretation and integration”. Moreover, Regans, Argote and Brooks (2005) studied group learning “by examining joint-replacement surgery in teaching hospitals and concluded that increased experience working together in a team promoted better coordination and teamwork”.

Organizational level is the highest level where “groups come together to share their knowledge they have acquired through the process of communication, these learning are now transformed into an acceptable instructions for all organizational members and will be made assessable to everyone who needs them” (Amir-Kabiri, 2006). On the other hand, Argote (1999) discussed manufacturing plants managers’ point of view that saw “organizational learning occurs when they found ways to make individual workers more proficient, improve the organization's "technology, tooling, and layout”, improve the organization's structure, and determine the organization's strengths”.

Some theorists talked about a fourth level of organizational learning called inter-organizational level. It is where organizations collaborate, share and learn from each other. And one of the most important examples shared by Hjalager & Anne-Mette (1999) about this level was the franchising business model.

1.4 Types of organizational learning

Chris Argyris together with Donald Schön (1978) developed a significant model that elaborated our understanding of organizational learning types or models. In their study, they further discussed what differentiates between

three types of learning: “single-loop learning, double-loop learning, and deutero-learning”.

Single loop learning is a one direction type of learning where following the rules is the most significant aspect of it. It is mainly used when predetermined strategy, goals and policies are sound and unquestionable and the only emphasis is detecting and correcting deviations from these rigid fundamentals. For Argyris and Schön (1978) single loop learning occurs “when the error detected and corrected permits the organization to carry on its present policies or achieve its present objectives ... it is like a thermostat that learns when it is too hot or too cold and turns the heat on or off. The thermostat can perform this task because it can receive information (the temperature of the room) and take corrective action”. In parallel, Peter Senge (1990) viewed “single loop learning as related to adaptive learning or coping”. Adaptive learning that mostly known as survival learning which focuses on detecting and solving problems without examining or challenging the existing norms and behaviors. However Mason (1993) went further to define “single loop learning as non-strategic learning”.

Double loop learning, in contrary to single-loop learning, has a main aspect of changing the rules. It challenges rigid fundamentals including strategies, objectives, behaviors, policies, procedures ...etc. rather than accepting them. In fact, double-loop learning enables organizations to confront, reflect, and critically think about the appropriateness of their previous assumptions. For Argyris and Schön (1978), double loop learning occurs “when error is detected and corrected in ways that involve the modification of an organization’s underlying norms, policies, and objectives”. As from Peter Senge’s (1990) view, double loop learning is a generative learning that “enhances organizations capacity to create”; this intersects with Mason’s (1993) opinion that defines “double loop learning as strategic learning”.

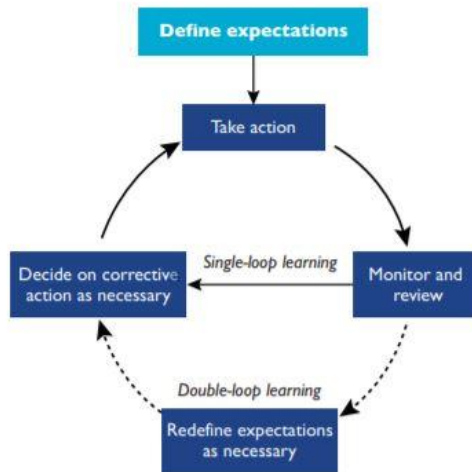


Figure 1: Single and Double Loop Learning (Armstrong, 2010)

Deutero learning is about learning how to learn. It occurs when organizations start to consider the way they think about rules and assumptions taking into account the possibility or the need to change these rules. For Argyris and Schön (1978) “deutero learning occurs when organizations learn

how to carry out single loop and double loop learning”. Some literatures referred to deuteron learning, as triple-loop learning; however, this term did not arise in Argyris and Schön published work.

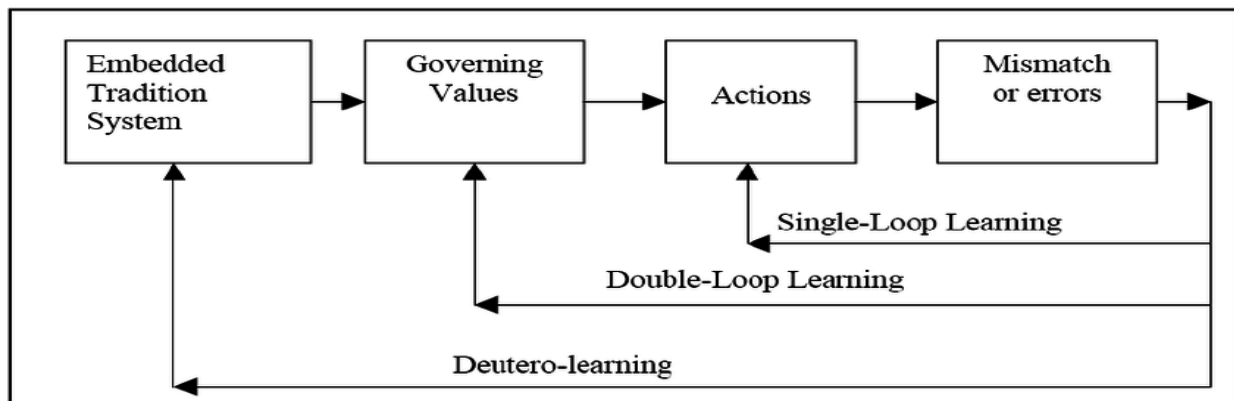


Figure 2. Deutero-learning. Source: Nielsen 1996, 36. Quoted in Seo 2003.

1.5 Importance of Organizational learning

The importance of organizational learning has been demonstrated throughout the numerous benefits attributed to it.

Among these benefits: increased productivity, efficiency and profits, lower turnover rate due to increased level of employees’ satisfaction and commitment, creation for a culture of knowledge sharing, inquiry and learning, development of leaders at all levels across the organization, improvement of teams and individuals’ ability to embrace and adapt to change, and lastly higher investments and adoption to technological innovations.

In addition, a positive association has been spotted between turbulence degree and organizational learning; which means the greater the disorder exist the greater the organizational learning is needed. This suggests additional benefits that includes higher flexibility, better responsiveness, enhanced creativity, improved innovation and problem solving ... which in turn leads to higher competitiveness, growth and success in the market.

1.6 Barriers for organizational learning

It is easier said than done! In fact, studies show that despite organizational learning importance and its critical influence on organizations’ success and their ability to survive,

there are still numerous barriers and significant impediments hindering it.

First, employees' stubbornness and resistance to change. This is mostly related to the oldest tenured employees who resist to leave their comfort zone and avoid learning new processes and systems. *Second*, lack of direct leadership and leadership training. Leaders must lead by example. They must be present and involved in every aspect of organizational learning. Besides, there are certain skills that leaders must learn and develop in order to guide changes and learning efforts effectively. Among these skills are the communication, change management, crisis management, project management, emotional intelligence, knowledge management...etc. Leaders must be capable of setting clear goals for organizational learning, besides designing intuitive processes that capture and circulate knowledge. *Third*, ignorance of team success. This is mostly related to corporate cultures that favours personal success over teamwork accomplishments. In such cultures, it would be very difficult to engage employees in organizational learning programs that might not fit their personal goals. It could be also attributed to incentives' deficiency for individuals or teams to participate in organizational learning activities. *Fourth*, ignoring the elephant. Many organizations experience problems in their environment and that is normal; but the risk lies on those problems that nobody wants to discuss them. Such behaviour jeopardizes the whole learning dynamics. *Fifth*, absence of motivation for growth. When individuals are not motivated to grow or when they undervalue learning for its own sake, they would never seek out opportunities offered by their organizations. *Sixth*, short-term focus. Many organizations fall into the trap of solving their problems in the short term paying no attention to the big picture that includes learning skills for long-term benefit. *Seventh*, complexity. Sometimes leaders forget or ignore people's frustration; thus, unintentionally complex things for them rather than keeping it simple. *Eighth*, organizational structure. Organizations adopting bureaucratic structure negatively affect organizational learning process, because it is a structure where only single loop learning is applied. It is a structure where subunit goals dominate shared goals opening the door for politics development, which could be considered

another barrier for learning. *Ninth*, rewarding, and punishing system. This point was raised by Chris Argyris and Donald Schön that explained how sometimes employees mislead their managers and hide mistakes or problems from their superiors as a kind of defensive routine once felt threatened or vulnerable. Instead of sharing the right feedback, they hold back or even replace it with misleading news obstructing the whole learning process.

However, *obstacles do not have to turn into failures* - a valuable lesson we learned from Thomas Edison. Actually, the principles of cybernetics that will be discussed in the next chapter offer a framework for thinking about how organizational learning objectives can be attained. In fact, it provides insights and practical measures, which could transform the organization into a non-stop learning one.

Chapter 2. Cybernetics

While organizations are in danger, facing unprecedented aggregating turbulence at their socioeconomic environments, desperate to have robust, virtuous and viable system to face this chaos; cybernetics, "the science of communication and control" (Wiener, 1948), "has its own way of examining these crises. It understands them to be crises of regulation, and it offers powerful concepts and models for dealing with them— not only in the therapeutic mode, but also by prevention ... it is about how to cope with the challenge of ubiquitous complexity ... it" (Schwaninger, 2004).

2.1 Origin and Definition of Cybernetics

Cybernetics "is a scientific field that investigates regulatory systems, their structures, constraints, and possibilities. It is an interdisciplinary study of the structure of regulatory systems. The essential goal of cybernetics is to understand and define the functions and processes of systems that have goals and that participate in circular, causal chains that move from action to sensing to comparison with desired goal, and again to action" (Ilková, V. ; Ilka, A, 2016). Cybernetics provides means to examine system's structure and function; how it functions, how it controls its actions, and how it communicates with its own components and with other systems. According to Littlejohn (2001), "a very simple cybernetic system will consist of what calls a sensor, comparator, and activator. The

sensor is used to provide feedback to the comparator, which in turn decides if the machine is off basis. The comparator then gives guidance to the activator. This then provides an output, or feedback and the feedback is in some way affective to the environment". Based on this understanding, the first who invented an artificial automatic regulatory system that doesn't require any external intervention between the feedback and its control system was mechanician Ktesibios. Despite that, his invention was considered a field of engineering, Ktesibios' concept still be some of the first studies of cybernetic principles. "In his water clocks, water flowed from a source such as a holding tank into a reservoir, then from the reservoir to the mechanisms of the clock. Ktesibios's device used a cone-shaped float to monitor the level of the water in its reservoir and adjust the rate of flow of the water accordingly to maintain a constant level of water in the reservoir, so that it neither overflowed nor was allowed to run dry" (The Roots Of Cybernetic Theory Philosophy Essay, 2018). Thermostat, is another recent invention, which presents a cybernetic system that works on keeping room temperature constant (target) despite the temperature changes in the environment.

Cybernetics, as a term itself, "stems from the Greek word κυβερνήτης-meaning steersman, governor, or pilot." (Targowski, 2011). Plato first used it in the context of "the study of self-governance". On the other hand, André-Marie Ampère used the term cybernétique in 1834 in his classification system of human knowledge to highlight the sciences of government. However, the history of cybernetics, as reported by Vaughn (2002), can be traced to early 1940s & 1950s where Macy foundation called for a series of meetings about "circular casual and feedback mechanisms in biological and social sciences". During those meetings, Norbert Wiener coined the name "Cybernetics" for the discipline and defined it in his book as the "control and communication in the animal and the machine". In parallel, Gareth Morgan (1997) mentioned in his book "*Images of Organization*", that cybernetics "are found most in the research activities of Wiener and his colleagues during World War II, particularly in the attempt to develop and refine devices for the control of gunfire. Cybernetics emerged from this design challenge, as scientists expert in mathematics, communications theory,

engineering, social and medical science combined their skills and insights to create machines with computational and adaptive capacities of a living brain" (Morgan, 1997). Norbert's study "led to a way of thinking about perception, behavior, and cognition that is revolutionary, not so much because of the problems it attacks, but rather because of the way in which it views them" (Ozer, 1979).

In fact, cybernetics acquired many definitions. While Wiener (1948) defined cybernetics as "the art of steering to evoke the rich interaction of goals, predictions, actions, feedback, and response in systems of all kinds", Stafford Beer called it "the science of effective organization". On the other hand, Louis Couffignal (1956), suggested cybernetics as the "the art of ensuring the efficacy of action" and Littlejohn (2001) as the "study of feedback". Recently, in 2007, during a discussion group, Kauffman, President of the American Society for Cybernetics, suggested another definition to cybernetics. According to him, "Cybernetics is the study of systems and processes that interact with themselves and produce themselves from themselves."

In simpler words, as suggested by Vaughn (2002), cybernetics, "is a theory that is very relevant and practical at any level because it optimizes the transmission of feedback through any sort of communication channel, and it explains how the system functioned".

2.2 Cybernetics' Transition from First Order to Second Order

In 1970 Heinz von Forester "distinguished first and second order cybernetics: the study of observed systems and the study of observing systems. Its emphasis is on how observers construct model systems with which we interact" (Vaughn, 2002). This intersects with Geyer and Van der Zouwen's (1978) observation that "noted a transition from classical cybernetics to new cybernetics". According to them, "these shifts in thinking involve, among others, a change from emphasis on the system being steered to the system doing the steering, and the factor which guides the steering decisions; and a new emphasis on communication between several systems which are trying to steer each other" (Bailey, 1994).

First order cybernetics, is a simple version of cybernetics. It is a process based on

feedback where the focus is mainly on the observed system neglecting any role for the observer. Where according to Bale (1995) “feedback is a recursive process whereby a system’s behavior is scanned and fed back through its sensory receptors. Data about the system’s previous actions, as a part of the input it receives, is monitored, allowing the system to ‘watch’ itself, and thus signal the degree of attainment or non-attainment of a given operation relative to pre-established goals. This process allows a system to alter its output and thereby regulate or steer its behavior in relation to its pre-encoded goals”. This process enables the system to steer its behavior according to its pre-coded goals. This emphasizes two forms of feedback, positive and negative. Negative feedback refers to the absence of deviation between the system’s actual behavior and its prearranged goal, which negates the need for any change. Based on this understanding, negative feedback is recognized as a stabilizer for the system that maintains its stability and constancy. Conversely, positive feedback denotes discrepancy between the system’s actual behavior and its pre-determined outcome, which calls for a modification in the system’s operation that lasts until the system is on target again and thus negative feedback is restored again.

On the contrary, second order cybernetics, which was famously known as the cybernetics of cybernetics, stresses on the relation between the observer and the observed system that is particularly recognized as circular. In fact, second order cybernetics proposed an active and dynamic relationship between the observer and the observed system where the observer interacts and influences the internal setting of the system. Here the role of the observer is no longer neutral and detached, yet valuable and recognizable. As discussed by Von Forester (1981), “second order cybernetics helps explain how the observation process itself is a system in which feedback loops are established between the observer and the observed”; taking into account, that the system is affected by the observer and affects him/her as well. Second order cybernetics, in contrast to first order cybernetics, allows the observer to question the pre-set norms not only the output, and to change them as a reaction of their ineffectiveness.

Second-order cybernetics that was defined by Foster (1974) as “cybernetics of observing systems,” in contrast to first-order cybernetics that he defined it as the “cybernetics of observed systems” varies in different dimensions. Peter Cariani (2016), senior research scientist at Boston University highlighted in his paper “Beware False Dichotomies” these dimensions and presented the most commonly cited distinctions (Figure 3).

Dimension	First-order	Second-order
	Commonly cited distinctions	
Approach	Reductionism	Holism
Method	Analysis	Synthesis
Primitives	Entities	Relations
Processes	Deterministic	Probabilistic
Relation to designer	Controlled	Autonomous
Relation to designer	Designed	Self-organized
Embeddedness	Context free	Context dependent
Role of observer	Observer-free	Observer-dependent
Position of observer	Outside observed system	Embedded in observed system
Theory dependence	Theory-free phenomena	Theory-determined phenomena
Metaphysics	Ontology	Epistemology
Working framework	Naïve or critical realism	Pragmatism, radical constructivism
Aim	Understanding (prediction)	Action (intervention)
Definition	Clarity, operational definitions	Ambiguity as opportunity
Subjects	Inanimate objects (nonhuman)	Thinking participants (human)
Reflexivity	Unreflexive	Reflexive
Medium of interaction	Physical	Language
Mode of interaction	Communication	Conversation

Figure 3: First-order/Second-order cybernetics most commonly cited distinctions Source: (Cariani, 2016)

2.3 Cybernetic characteristics

For the sake of better understanding some major cybernetic characteristics, a study of human brain characteristics that is considered one of the most “complex cybernetic systems” (Morgan, 1997) was done.

Taking into account the brain functions as a whole and its holographic design in particular, five major characteristics were detected.

First was to build the whole into the parts. As mentioned, the brain is designed in a holographic way where the whole is built into the parts. This implies any part within a cybernetic system with brain-like capacities of self-organization should represent the whole. “Just as DNA in nature carries a holographic code that contains the information required to unfold the complete development of the human body” (Morgan, 1997). At the same time these parts should be specialized yet operating holistically within a highly connected intelligent network.

Second was redundancy. The brain showed the importance of redundancy for the system. As explained by Gareth Morgan (1997), “at any one time many parts of the brain may be involved with the same activity or information. This redundancy allows initiatives to be generated from many locations at once, thus reducing dependence on the activities of any single location”. This critical characteristic provides the brain with the needed flexibility, creativity, and adaptability for facing any disturbance or sudden change.

Third was variety. Variety is a significant characteristic that enables the brain to face complexity. The first to talk about this concept was W. Ross Ashby. Ashby (1952) said, “Variety absorbs variety”. According to him, “the internal diversity of any self-regulating system must match the variety and complexity of its environment if it is to deal with the challenges posed by that environment” (Morgan, 1997). Gareth Morgan (1997) put it also in a different frame and suggested that “any control system must be as varied and complex as the environment being controlled”.

Fourth were minimum specs. The holographic design of the brain required minimum specifications to have the freedom to self-organize. As discussed by Morgan (1997) “the system must possess a certain degree of space or

autonomy that allows appropriate innovation to occur”. However, he distinguished between autonomy and responsible autonomy stressing on the importance of avoiding “the anarchy and the completely free flow that arises when there are no parameters or guidelines, on the one hand, and over centralization, on the other” (Morgan, 1997).

Fifth was learning to learn. In fact, this was the most fundamental characteristic that comprises most of the cybernetics thinking. This characteristic refers to four key principles besides a distinction between simple (first order) and complex (second order) cybernetic system. According to Morgan (1997), “(1) systems must have the capacity to sense, monitor, and scan significant aspect of their environment. (2) They must be able to relate this information to the operating norms that guide system behavior. (3) They must be able to detect significant deviations from these norms. (4) They must be able to initiate corrective action when discrepancies are detected”. While the simple system detects and corrects deviations from predetermined norms, the complex system detects and corrects errors in operating norms.

Chapter 3. The Impact of Cybernetics on Organizational Learning

In a world where the only constant is change, organizations’ viability depends highly on their system’s capacity to meet the demands of such turbulent environment. Capacity that depends mostly on their learning curve including knowledge, experiences, and skills they developed empowered by the cybernetic mindset that embraces environmental changes as a norm and opportunity to develop.

This perception was stressed out by different theorists, mainly Stafford Beer, who looked throughout his management cybernetics studies into the relationship between organizational learning and cybernetics especially upon facing change and complexity. His Viable System Model known as VSM, offers organizations a framework for designing viable, flexible, adaptable, and thus learning organizations that have the capacity to self-regulate, learn, adapt, and evolve in an endless changing environment. Beer (1972) explained that viable organizations are skilled in scanning and spotting external changes and in return developing an adaptive behavior based on their

best knowledge and organizational learning experience. From a cybernetic view, “organizational learning is improved by creating a learning context that favors a proper management of complexity at each organizational level and among different recursive levels. Sustainable learning communities engage in self-conscious processes. They “learn to learn.” They review, when required, their own purposes, values, and social structures” (Espinosa, 2004).

Besides Beer, Gareth Morgan also highlighted in his discussion about learning organizations, how organizations could successfully benefit from double – loop learning cybernetic principle. He suggested, “Organizations must develop cultures that support change and risk taking. They have to embrace the idea that in rapidly changing circumstances with high degrees of uncertainty, problems and errors are inevitable. They have to promote an openness that encourages dialogue and the expression of conflicting points of view. They have to recognize that legitimate error, which arises from the uncertainty and lack of control in a situation, can be used as a resource for new learning. They have to recognize that genuine learning is usually action based and thus must find ways of helping to create experiments and probes so that they learn through doing in a productive way” (Morgan, 1997). Morgan was also able to show the close relation and influence that cybernetics has on organizational learning upon discussing the need to encourage emergent organizations. According to him, “the behavior of the intelligent systems requires a sense of the vision, norms, values, limits, or “reference points” that are to guide behavior else it will be complete randomness... But these “reference points” must be defined in a way that creates a space in which many possible actions and behaviors can emerge including those that can question the limits being imposed! ... Cybernetic points of reference create space in which learning and innovation can occur” (Morgan, 1997)

In Parallel, Cyert and March (1963) described organizational learning as part of its decision-making process that consist of four major activities: Quasi-resolution of conflict, Uncertainty avoidance, Problematic search and Organizational learning. This intersects with the cybernetic perspective that looked into the organizational learning as a way of processing

data to construct knowledge for effective control and decision-making. A good example of this is the “Ringi” technique (Japan Quality Circles) used in Japan as a collective process for decision-making. Under this process, people share, develop, and refine issues, problems, and ideas in a circular way-seeking consensus among the entire group, which in return guarantees cooperation and speeds up the implementation. In fact, “Ringi” system established a double loop learning mindset as “it serves the dual function of allowing people to challenge core operating principles and in both the process and the outcome to affirm and re-affirm the values that are to guide action. Paradoxically, it is a process that mobilizes the disagreement to create consensus. It is also a process that allows innovation to be driven from all direction and for intelligence to evolve higher and higher levels” (Morgan, 1997).

Furthermore, the cybernetician Humberto Maturana (1970) tackled the relationship between a living learning system and cybernetics from different angle. He proposed that “the living system, due to its circular organization, is an inductive system and functions always in a predictive manner: what occurred once will occur again”. This implies that organizational learning systems will have recorded activities in its memory, whenever there is a disruption the appropriate activity will be recalled to regulate the system. Otherwise as suggested, by Hume “If there be any Suspicion, that the Course of Nature may change, and that the past may be no Rule for the future, all Experience becomes useless, and can give rise to no Inferences or Conclusions” (Hume, 1748/1963). However, the learning process unquestionably starts with random choice of an activity in response to a negative feedback, where the trial and error practice lasts until finding the right response and thus allowing a new pattern of action to emerge based on new learning experience. In this context, and from double-loop learning perspective, cyberneticists recognize disturbance as a source of learning and assess mistakes during high uncertainty as legitimate errors and sources for new learning.

Chapter 4. COVID 19 – Questioning Concepts’ Viability during a Mutating Crisis

As COVID-19 pandemic progresses, people, organizations, and government are facing a formidable, constantly changing and turbulent

environment. As per McKinsey's latest report "5 ways to manage a crisis, according to McKinsey", business leaders across the world are claiming, that they have never experienced a similar thing before. "There is no script for dealing with a crisis that is this far-reaching and unpredictable. The only way to respond effectively is to decide what actions to take as the situation unfolds" (D'Auria and De Smet, 2020). This intersects with latest Gartner's Business Continuity Survey findings (March 2020) that showed that "only just 12 percent of 1200 organizations surveyed are highly prepared for the impact of coronavirus".

On other hand, Gloria Tam (2020), the associate dean of corporate and lifelong learning at Minerva Project, proposed, "The past few weeks' events underscore the need for business and society to be resilient and prepared for times of uncertainty. The crises could be an opportunity and an impetus for change, to catalyze the much-needed innovation. To build resilience for a future-proof learning and development sector, and to form new and improved learning habits in your organization". Actually, these insights are not as novel as COVID 19 pandemic is, yet they are as old as the cybernetic mindset emerged. A mindset that, as we already mentioned, assesses crisis as a crisis for regulation, besides offering a framework for dealing with it not only from therapeutic mode yet from a prevention mode as well.

According to Bill Gates (2018), which definitely fits the context today, "Success today requires the agility and drive to constantly rethink, reinvigorate, react, and reinvent". Wasn't that a desperate call for adopting double loop learning mindset and thus moving into learning organizations that is resilient and robust enough to deal with such unprecedented event? Surprisingly "32% of senior executives rarely update their operating model" according to initial data from an ongoing Intelligent Operations survey by Accenture and Oxford Economics (Accenture, 2020).

Whilst crisis has never been recommended as an appropriate time to set-up new ways of doing things, this pandemic leaves organizations to survive without any other choice but operating in new ways and thus testing their resilience as they have never done before. Interestingly, Matt Shinkman, vice president in the Gartner Risk and Audit practice, highlighted implicitly the

importance of learning organization and claimed that "the best-prepared organizations will manage the disruption caused by the coronavirus far better than their less-prepared peers" (ARLINGTON, Va., 2020). So far, these insights were supported by many real cases.

According to Washington Post, in its article "*the new coronavirus economy: A gigantic experiment reshaping how we work and live*" (March 2020), "some businesses across America are getting crushed, like Powell's Books in Portland, Ore., which closed its doors for at least eight weeks. Others are thriving, like Amazon, which announced 100,000 new hires to help manage the rush of online orders. Still others, like Tampa's Rooster & the Till restaurant, are adapting — in ways that, economists say, might lead to long-term shifts in how Americans spend, work and live". With the new habits and behaviors enforced from self – quarantine to social distancing, COVID -19 is suppressing any business with in-person interactions and boosting almost any business that can be done online or with minimal human physical contact. Therefore, any organization that would be able to critically think about the appropriateness of its previous behavior, rapid enough to re-assess its operations and resilient enough to respond and re-orient its business toward a digital mindset, will definitely navigate this crisis successfully and emerge stronger. As an example, "Walmart is adding 150,000 position to keep up with the online booming demand. 7-Eleven is hiring 20,000 people to deal with the unprecedented crisis. Universal Pictures is replacing its release for its animated adventure "Trolls World Tours" in April with online streaming. Netflix, replacing the traditional cinemas' experience, are reviving their Netflix party service by updating the extension to add more servers allowing it to deal with the influx of use. Video games are booming to reach 120\$ billion with hundred thousands of players increasing steadily. E-sports are emerging to replace the shuttered traditional leagues. Schools and universities are suspending their academic sessions and innovating with online approaches. Organizations across different sectors are pushed toward working remotely from home where "the top downloads of Apple's App Store last week included video-chat services from Zoom, Google and Microsoft, whose workplace app Teams said it climbed from 32 million to 44 million everyday

users in nearly a week” (Timberg, Harwell, Reiley and Bhattarai, 2020). “Dubai Mall, one of the largest shopping malls globally, is helping 1,300 brick-and-mortar stores to go digital in a few weeks. There are even debates whether the U.S. Congress convenings should be moved online, with some predicting that by the time the pandemic is over, the way politics, lobbying or even government elections are conducted could be changed forever” (Tam,2020).

Currently organizations are haphazardly trying to learn the necessary skills needed to navigate through COVID-19 crisis and mostly confused with the best course of action required to survive especially that most of what is taking place is unprecedented. However, leaders cannot wait until information is clear and enough. As Morgan (1997) said, “They have to embrace the idea that in rapidly changing circumstances with high degrees of uncertainty, problems and errors are inevitable. They have to recognize that legitimate error, which arises from the uncertainty and lack of control in a situation, can be used as a resource for new learning”.

However, an early noteworthy lesson was highlighted by Arthur D Little (2020) in their report “Leading businesses through the COVID-19 crisis”. According to the report, “once the current crisis has been overcome, there will be a new opportunity to “get things right” and ensure that organizations become more agile and dynamic to deal with future threats by creating more integrated environments supported by a digital approach. This will ensure the right information gets to the right level of management at the right time, so timely and effective decisions can be made to drive resilience and protect the interests and well-being of all internal and external stakeholders. Risk management functions need to be more dynamic in terms of “sensing, feeling and reacting” to signals across both internal operations and external supply chains to ensure the business is fully prepared for the threat. Digital tools are a key part of the solution to enable this.” (Eagar, Teixeira, Taga and Caldani, 2020). Isn’t this another call for an organizational learning experience leveraged by cybernetic thinking?

Definitely, a further deliberate study will help us more to answer this question and to assess

its viability in the most threatening period in history.

Chapter 5. Conclusion

Buddha once asked a student: “If a person is struck by an arrow, is it painful? If the person is struck by a second arrow, is it even more painful? He then went on to explain, “In life, we cannot always control the first arrow. However, the second arrow is our reaction to the first. And with this second arrow comes the possibility of choice.” (Hougaard, Carter and Mohan, 2020)

Organizations have always had the opportunity to build their learning curve, to build on their previous knowledge and experiences, which in return increases their capacity to control the upcoming arrows effectively. However, many of them were myopic and trapped in their inertia without any capacity to adapt and respond to unexpected changes.

It is true that organizations might be facing unprecedented crisis that, as stated by Arthur D little (2020), “has a degree of severity, velocity and uncertainty which transcends many of the scenarios that were previously envisaged”; however, learning organizations as proposed by Garvin (1993), “are skilled at creating, acquiring, and transferring knowledge, and at modifying its behavior to reflect new knowledge and insights”. These organizations supported by their cybernetic mindset will be resilient and ready to learn and recover from their failure and loss. They will integrate what they have learned from the COVID-19 crisis management, mainly the experience rapid decision-making, working remotely, managing remote teams, delegation during the crisis, and much more to improve resilience and responsiveness in the post-crisis world. These organizations represent a real case studies and practical demonstration for cybernetics and its effect on organizational learning.

Yet, within the rapid mutating crisis, the rate at which organizations may learn and respond might become the only determinate not only for success, but also for survival.

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- manner; what occurred once will occur again. Its organization (both genetic and otherwise) is conservative and repeats only that which works." (Maturana 1980, p. 39)
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