

opción

Revista de Antropología, Ciencias de la Comunicación y de la Información, Filosofía,
Lingüística y Semiótica, Problemas del Desarrollo, la Ciencia y la Tecnología

Año 36, 2020, Especial N°

26

Revista de Ciencias Humanas y Sociales

ISSN 1012-1537/ ISSN-e: 2477-9385

Depósito Legal pp 198402ZU45



Universidad del Zulia
Facultad Experimental de Ciencias
Departamento de Ciencias Humanas
Maracaibo - Venezuela

Understanding Chaos Theory's Implications on Strategic Decision-Making

Nuha Hamada¹

¹Al Ain University

Nuha.hamada@aau.ac.ae

Rene Paquibut²

²Al Ain University

rene.paquibut@aau.ac.ae

Abstract

Strategic management is the process of establishing long term goals, deciding what strategies are appropriate to achieve those goals, and carrying out the needed steps to implement those strategies. The effectiveness of the strategy lies in the precision of the analysis given that an organization is a complex system. One theory that has gained attention in strategic management is the chaos theory, which is the study of nonlinear dynamic systems like business organizations. This paper explored related literature to understand the general application of the theory in the process of decision-making. The paper illustrates that the theory can be considered as a critical framework in the process of decision-making in organizations.

Keywords: Organizations, Decision-making, Management, Chaos theory, Effect.

Comprender las implicaciones de la teoría del caos en la toma de decisiones estratégicas

Resumen

La gestión estratégica es el proceso de establecer objetivos a largo plazo, decidir qué estrategias son apropiadas para lograr esos objetivos y llevar a cabo los pasos necesarios para implementar esas estrategias. La efectividad de la estrategia radica en la precisión del análisis dado que una organización es un sistema complejo. Una teoría que ha llamado la atención en la gestión estratégica es la teoría del caos, que es el estudio de sistemas dinámicos no lineales como las organizaciones empresariales. Este artículo exploró la literatura relacionada para comprender la aplicación general de la teoría en el proceso de toma de decisiones. El documento ilustra que la teoría puede considerarse como un marco crítico en el proceso de toma de decisiones en las organizaciones.

Palabras clave: Organizaciones, toma de decisiones, gestión, teoría del caos, efecto.

1. INTRODUCTION

Strategic management is the process of establishing long term goals, deciding what strategies are appropriate to achieve those goals, and carrying out the needed steps to implement those strategies. In short, strategic management sets up the organization for long-term competitiveness. Planning, which is the primary function of management, depends largely on how best managers are able to

analyze the interaction between its external and internal environments to formulate strategies that when carried out effectively can achieve organizational goals. Strategies are creative solutions that are often taken by top management in solving organizational problems. Such creative solutions can only be as good as the analysis that managers put into the planning process. These solutions are themselves decisions—resulting from the consideration of internal and external information and the perceived implications these have on the future of the organization. The effectiveness of the decision/solution in actually solving the problem lies in the precision of the analysis given that an organization is a complex system. However, choosing an appropriate management theory to facilitate decision-making in complex systems such as an organization can be problematic. One theory that has gained attention in strategic management is the chaos theory, which is the study of nonlinear dynamic systems like business organizations (Levy, 1994).

Challenges appear when applying this theory, including the absence of training on its use in the process of decision-making. To investigate these challenges, this paper explored related literature to understand the general application of the theory in the process of decision-making. This paper paid attention to two linked variables: the “butterfly effect” (the independent variable), and “decision-making in organizations” (the dependent variable). The premise of this paper is: the process of decision-making in organizations is improved by enhancing the butterfly effect, and vice versa. In particular, an empirical investigation using the qualitative method—particularly the

interview method was conducted. Nine individuals (employees and employers of a well-reputed organization) were interviewed to determine the acceptability of the actual application of the chaos theory by those involved in organizational decision-making.

2. METHODOLOGY

An organization is an open system that is connected to other systems within a larger environment. Internally, the organization can be viewed as a dynamic process of transforming inputs into outputs, in continuous pursuit of the elusive goal of satisfying customers. Externally, the organization can be viewed as an entity that strives to survive in a very competitive environment—competing for resources and markets. The systems view of the firm suggests that one looks at both the interconnectedness of the details within a system and the interconnectedness of the systems within a larger environment. This view points out the complexity of the organization as a dynamic system.

Pioneered by Lorenz, chaos theory is the study of complex, nonlinear, dynamic systems (Levy, 1994). A non-linear dynamic system is one where any relationship between time-dependent variables is non-linear and is expected to be in a particular state of equilibrium at a given time (Dhillon & Ward, 2002). Chaos theory focuses on the behavior of dynamic systems that are sensitive to the initial conditions. Sensitivity to initial conditions refer to the

dependence of outcomes to initial conditions, regarded as the butterfly effect--where a little change in a specified state of the deterministic nonlinear system may result in larger differences in the later state. (Bright & Pryor, 2011) Hence, the butterfly effect can illustrate the way by which the implications on a taken decision will impact on others in the organization (Milliner, Lloyd A., 2006 & Skar, P., 2004). Dynamic law allows predicting the course of the physical process and creating the mathematical model of actual systems, but it is possible only if the initial conditions have been described properly and with high precision. (Šarlošia, et.al., 2014).

Mainstream literature in business management suggests that in order to achieve success, a system must adapt to its environment. The notion of an environment is however confusing. In fact, any one system may act as an environment of another system. This could possibly result in a sequence of events that have a chaotic effect on the behavior of all other systems. In this respect, the environment of a system should not be considered as given, rather it is consequence of interactions between different systems. It is therefore difficult to suggest a clear cause and effect relationship between a particular system and its environment. (Dhillon & Ward, 2002)

3. DISCUSSION

To make organizations successful, top managers should make better decisions. However, when the environment appears turbulent

because of the butterfly effect, the opportunity for making choices may occur often while the outcomes will have larger implications on the long-term viability of the organization. Developments in both the internal and external environments of the firm provoke challenges to managers i.e. greater competition for funds, declining governmental funding, and increasingly more demanding markets. Comprehending the way by which organizations can make further strategic decisions is serious not only due to the results influencing its long-term viability, but also due to their implication on organizations' links to the surrounding environment. (Cray & Inglis, 2011) In addition and adding to its complexity, organizations are social systems and are subject to intervention by individuals and other organizations. (Levy, 1994) This makes decision-making a much more challenging process within the management function of planning. In order to understand the relevance of chaos theory to strategy, organizations have to be conceptualized as complex, dynamic, nonlinear systems. (Levy, 1994)

In chaotic systems, small disturbances multiply over time because of nonlinear relationships and the dynamic, repetitive nature of chaotic systems. As a result, such systems are extremely sensitive to initial conditions, which makes forecasting very difficult. (Levy, 1994) In strategic management, particularly in strategic planning, formulating a long-term plan depends largely on forecasting. How well the forecast can be given the chaotic nature of the organization as a social system relies heavily on the capability of managers to process historical information and precisely identify the factors that when considered as a whole would lead to the identification of the correct

strategy. People involved in planning, whether in business, economics, or some other area, have always known that models are always just models, that forecasts are uncertain, and that uncertainty grows over time. (Levy,1994) The notion that long-term planning for chaotic systems is not only difficult but essentially impossible has profound implications for organizations trying to set strategy based on their anticipation of the future. Rather than expend large amounts of resources on forecasting, strategic planning needs to take into account a number of possible scenarios or outcomes. (Levy, 1994)

A chaos theoretic perspective in business management takes a very radical viewpoint. It asserts that it is impossible to manage any major change in terms of its long-term specifics. This is because of the inherent unpredictability of such outcomes. (Dhillon, 2002) While the complexity of industry systems dictates the need for broad strategies, the dynamic nature of chaotic systems mandates that strategies adapt. As industry structures evolve and competitors change their strategies, a firm clearly needs to change its own guidelines and decision rules. (Levy, 1994)

In the complicated planning contexts, inappropriate responses of the manager may result in devastating the organizational influences akin basically to the butterfly effect in the chaos theory. Watkins et al., (2017), advanced a simple model specified for leadership education focusing on a designed program, to develop the leaders that comprehended the complex systems' nature while adapting to some of the emergent situations. Chaos theory can provide leadership with strong values, guiding visions, open communication, and critical

organizational beliefs. From the side of the leaders, the butterfly effect requires the capacity to illustrate the specific possible scenarios that are validated by experience, facts, and are evidence-based. This emphasizes the need for participative planning, where the manager performs the function of planning with people who are on the ground and have the experience of what are actually happening—requirement for future scenario building or outcomes.

4. RESULTS

One of the serious challenges in the process of decision-making, in general, is ignoring to empower employees. Some of the participants who are working as employees in organizations stated that ignoring their voices and opinions is demotivating. This is a fact, based on the argument of Aditi (2011) who recommended to empower employees and hear their opinions basically in the process of decision-making. In line with this, Carmeli & Schaubroeck (2006), debated that, the responsibility of top management is to hear the opinions and related facts from the employees, to avoid any decline in business sustainability. Focusing on such fact and when looking at the benefits gained from chaos theory and its elements, the matter is clear that, this theory illustrates the necessity for an efficient leadership, which has the guiding vision, strong organizational values and beliefs, along with the urgency of open communications. On the other hand, the butterfly effect has an advantage based on the leadership's vision that in turn

starts with a specified capacity that illustrates the related virtues especially during their daily interactions with their employees.

Employers who participated in the interview revealed that the needs of the team should be expressed more obviously, whereas the relationship between the manager and his team should be better and on focus, while at the same time, accommodating change. Other employers insist on the importance of finding out new tools by which, chaos theory can be developed to solve the issues of decision-making.

Generally, and accordingly, organizations should revise their missions and visions while adopting a more customers responsive approach, which should be the initial decision taken by the concerned management. Based on that, the matter is obvious that chaos theory can assist the organizational learning apart from just employees' learning. The organizational learning hence, needs the accomplishment of all the partners altogether to perform their assigned tasks by linking each partner's knowledge and experience with the gained ability through their specified mutual interactions.

5. CONCLUSION

The paper articulates an in-depth discussion and qualitative analysis of the implications of chaos theory on decision-making, particularly its butterfly effect. The paper illustrates that the chaos theory can be considered as a critical framework during the process of decision-making in the organization. The butterfly effect of the chaos

theory makes forecasting an impossibly challenging process considering the many possible outcomes or scenarios that must be considered. This affirms the need for the planning process to be a shared responsibility among managers and employees. The precision and validity of identifying most likely scenarios and outcomes are dependent on the planning participants' use of experience, facts, and evidence which the manager must humbly recognize are not his/her sole domain.

The interview results affirm that employees are generally motivated by participation in decision-making. Thus, employees are not only reliable sources of inputs to the planning process, but that their participation in the planning process has a positive effect on their motivation.

REFERENCES

- Aditi, B. (2011). "Who should talk? What counts as employee voice and who stands to gain". *Marquette Law Review*, 94(3), pp. 869-888.
- Bright, J.E.H.; & Pryor, R.G.L. (2011). "The Chaos Theory of Careers". *Journal of Employment Counselling*, 48(4), pp. 163-166.
- Integration, Decision Quality, and Organisational Decline". *The Leadership Quarterly*, 17 (5), pp. 441-453.
- Cray, D.; & Inglis, L. (2011). "Strategic Decision Making in Arts Organizations". *The Journal of Arts Management, Law, and Society*, 41, pp. 84-102.

Creswell, J. W. (2009). *Research design: Qualitative, quantitative and mixed methods approaches*. Thousand Oaks, CA: Sage.

Dhillon, GURPREET. University of Nevada Las Vegas, USA JOHN WARD, Cranfield School of Management, UK. *Chaos Theory as a Framework for Studying Information Systems*. Article · April 2002 DOI: 10.4018/irmj.2002040101 · Source: DBLP.

Ghauri, P., & Gronhaug, K. (2005). *Research Methods in Business Studies*, 3rd ed. Great Britain: Pearson Education Limited.

Juraj Šarlošia, Jozef Bockob, Robert Suroveca . *Deterministic chaos* Procedia Engineering 96 (2014) 458 – 466.

Levy, D. (1994). *Chaos Theory and Strategy: Theory, Application, and Managerial Implications*. *Strategic Management Journal*. Vol. 15, pp. 167-178.

McMillan, K., & Weyers, B. (2010). *How to write dissertations & project reports?* Harlow: Prentice-Hall.



**UNIVERSIDAD
DEL ZULIA**

opción

Revista de Ciencias Humanas y Sociales

Año 36, N° 26, (2020)

Esta revista fue editada en formato digital por el personal de la Oficina de Publicaciones Científicas de la Facultad Experimental de Ciencias, Universidad del Zulia.

Maracaibo - Venezuela

www.luz.edu.ve

www.serbi.luz.edu.ve

produccioncientifica.luz.edu.ve