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Chaos attractors as an alignment mechanism between projects and organizational strategy

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Abstract

Chaos attractors have been studied in detail in the biological and environmental sciences and used to explain phenomena such as the Butterfly effect. Limited research has been done to identify and understand the use of chaos attractors in projects to help with alignment of project activities towards the project objective throughout the entire project duration. This paper will explore the literature on the use of chaos attractors as alignment mechanism between projects and organizational strategy. A conceptual model and propositions are proposed that could form the basis for further research.

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Keywords: attractor; complex adaptive system; point attractor, limit cycle attractor, strange attractor, phase space

1. Introduction

A total of 61% of executives indicated in a recent study that their organizations struggle to close the gap between strategy formulation and its day-to-day implementation (Economist Intelligence Unit, 2013). According to this study, organizational strategies are either poorly implemented or not implemented at all. The economic cost of such poor implementation is estimated on average at US\$109 million for every US\$ billion spend on projects i.e. 11% (PMI, 2014). The rapid changing and turbulent business environment requires firms to adapt their strategies on a regular basis. Strategic responses in a turbulent environment could range from “intrapreneurship” when there is a low understanding to “strategic intent” when there is a higher understanding of the business and operational

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environment (Garrat, 2003: 48). The concept of alignment between projects and organizational strategy in an ever changing turbulent business environment is key to ensure their successful implementation and could mean the difference between survival or destruction of a business. Dimitrov (2000) suggested that the concept of a strange attractor that originates from chaos theory could be used to align the complex thoughts and feelings of employees with the purposes of an organization. Could chaos theory and the concept of attractors perhaps provide a mechanism for alignment between complex constructs?

Chaos theory describes the concepts of attractors and attractor basins (Lorenz, 1995) where the trajectories of dynamical systems tend to converge towards attractors even with different initial starting conditions. The primary research question for this paper is if the concept of chaotic attractors could be used to attract and align projects with organizational strategy as indicated graphically in Fig. 1. The “ball-in-basin” representation (McGee, 2011) as shown in Figure 1a shows the trajectory of the dynamical system (project) that is converging towards a point at the bottom of the basin (organizational strategy) using a point attractor. A different three-dimensional view of a complex landscape is provided by Kent & Stump as shown in Figure 1b where the ball (project) may follow a number of different valleys in time. A specific valley may represent the desired organizational strategy while the others may represent the non-desirable organizational strategies. In this case the trajectory of the dynamical system (project) is aligned or progresses in the direction of a specific valley (organizational strategy) using a desirable attractor.

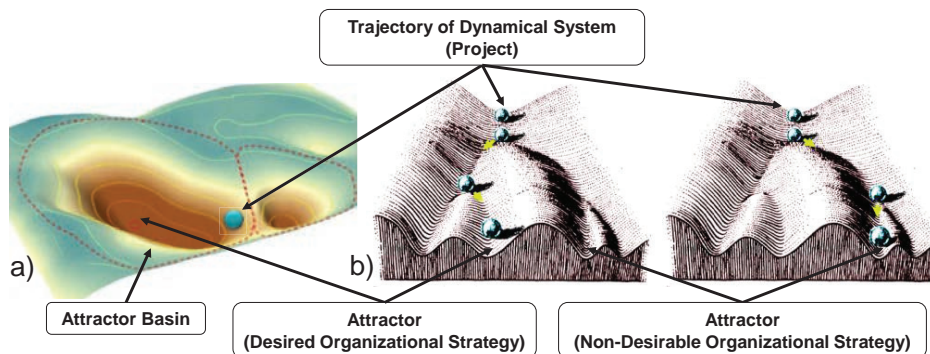


Fig. 1: a) The concept of an attractor and attractor basin (McGee, 2011) to attract a dynamical system. b) Complex landscape with different hills and valleys showing possible trajectories of a dynamical system (Kent & Stump, No date).

A number of interesting questions arise when viewing the landscapes in Fig. 1. Given a static landscape (stable organizational environment) how should a project be managed in order to allow for the possibility of attraction to the desired organizational strategy? If a project or program starts off towards the wrong attraction basin or valley, what needs to be done to change its trajectory towards the desired attractor? If the landscape is unstable (chaotic organizational environment) and the hills and valleys are also changing, how to steer the dynamical system towards a changing organizational strategy? Before these questions could be further explored, a better understanding is required of chaos, chaos theory and chaos attractors.

2. Literature review

2.1. Topology of attractors

Only three prominent attractor types will be explored in this paper namely the point attractor, limit cycle or periodic attractor and a specific chaotic attractor – the strange attractor. Although there are many other attractor types these three types sufficiently demonstrate the potential of using attractors for the alignment of constructs i.e. using attractors to potentially align projects with organizational strategy.

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