



Calm in the storm: Simulating the management of organizational co-evolution



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ABSTRACT

Whilst past research has explored the notion of co-evolution and ambidexterity in organizations, few have drawn from theoretical insights made in other domains of study such as biology and cultural evolution. This paper seeks to make a contribution towards this project, by developing an agent-based simulation model of multi-level co-evolution within an organization, with a view towards shedding new light on organizational adaptation. Unlike previous simulation studies of this nature, this study focuses on the co-evolution of behaviour at multiple-levels between interacting individuals, based on the evolutionary mechanisms of variation, selection and retention. In this way it is seen that incremental, punctuated and chaotic patterns of aggregate organizational behaviour arise from the same core building blocks of variation–selection–retention. The findings from this study point to the need for management control in ambidextrous organizations both during times of stability AND transformational change. In the latter case, this control was not that of an overpowering management suppressing variations and innovation from within the organization. Rather it might be interpreted as the voice of calm in the chaos of the storm, providing direction to the many actors within the organization and walking them along the thin line between inaction and chaos.

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1. Introduction

While past research has examined the phenomenon of organizational ambidexterity, and the need for organizations to both explore and exploit knowledge [1], few have explored the impact of multi-level considerations, within and beyond the organization, on this wider co-evolutionary process. In today's increasingly competitive and global business world the resilience of organizations to not only withstand and react to tumultuous business environments, but to anticipate, adapt and capitalize on future opportunities, has become a matter of significant importance for both research and practice in the management of futures [2]. On the one hand organizations need to develop and exploit a unique set of resources and capabilities which might lead to competitive advantage over others. At the same time, the firm needs to explore, discover and anticipate new opportunities as it adapts to an ever changing business world [1]. Given the complex nature of these challenges, some have called for research to adopt a more encompassing, co-evolutionary perspective [3]. However, few have taken up this invitation put forward by these calls. On the one hand, the interrelationships between different parts or levels in the organization is overlooked with research assuming that the organization behaves as one, with an all powerful top management team making choices on behalf of the wider firm [4]. Indeed some have viewed the

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tension between these processes of exploration and exploitation to be at the core of entrepreneurial behaviour [5], however unlike the lone, 'heroic' entrepreneur, organizations contain multiple voices and are characterized by complex, multi-level sets of inter-relationships. On the other hand, studies which do reflect this pluralism and examine such co-evolutionary interactions [6] fail to put forward a coherent conceptualization of what exactly is evolving within these different parts/levels and how such co-evolutionary processes might occur. In this co-evolutionary view practices, competences and strategic initiatives are seen to co-evolve through the interaction of individuals, groups, and managers [7–9], as organizations adapt to meet the changing needs of the external environment. In this sense, co-evolution can be defined as the joint evolution of entities at multiple levels [8,10,11] where changes of one entity/level influence changes at other entity/levels [12,13]. Co-evolutionary accounts are therefore inherently multi-level, exploring the multi-directional nature of causality [3].

In light of these issues, in this paper an agent-based model is used to simulate multi-level co-evolutionary processes within an organization as it adapts to both explore and exploit knowledge over time. So contrary to previous simulation studies, the focus here shifts from the top management team to include all parts and levels of the organization, and the complexity of voices, interrelationships and co-evolving parts, reflective of what most practicing managers experience in their daily lives. Second, the model is developed from a conceptualization of organizational change, in which different evolving entities at different levels/parts of the organization co-evolve through the mechanisms of variation–selection–retention. Given the complex longitudinal nature of changing behaviour in organizations, it is argued here that the development of theory can be further enhanced through the use of simulation models, which allow the researcher to explore these complex processes over time [4,14,15]. Computational models can capture the contextual and historical complexity of changing organizational behaviour [16], as the path-dependant co-evolution of interacting parts is modelled over time. Some of the findings of the study agree with past research in this area. So it was seen that the exploitation of knowledge is promoted through centralized control and power, and by lowering the capacity of frontline staff to change. On the other hand, increasing the capacity of frontline staff to change and increasing their proximity to customers, shifted the balance towards the exploration of knowledge. However in both the exploration and exploitation of knowledge, it was found that central management control was needed to improve organizational adaptability. With increasing levels of autonomy and innovation, it was seen that co-evolutionary behaviours across levels of the organization became increasingly chaotic, and as a result less fit with the demands of the environment. Central management control acted to stabilize behaviours and bring coherence to the multitude of voices within the different parts of the organization. In this sense, the role of management might be interpreted as the voice of calm in the chaos of the storm, providing direction to the many actors within the organization and walking them along the thin line between inaction and chaos. It is argued that by focusing attention on the co-evolution of behaviours across the organization, the approach adopted here can help unpick these potentially damaging behaviours, and inform both research and practice in this area. The paper is structured as follows. A review of the literature on organizational co-evolution is first given, followed by a discussion of the role of management in organizational adaptation in Sections 2 and 3 respectively. An outline of the agent-based model, and overview of the analysis of the simulation results, is then given in Section 4. This methods section is supported by additional details given in the Appendix. Key findings from the simulations are then presented in Section 5, followed by a discussion on implications for future research and limitations of the study in Sections 6 and 7.

2. Organizational co-evolution

Before exploring the role and nature of management in cases of organizational adaptation, the notion of co-evolution is first discussed. Examining the interrelationship between managerial intentionality and environmental changes rests at the core of co-evolutionary approaches in the study of organizational adaptation [3,6]. Interest in co-evolutionary processes has recently increased due to business environments becoming faster, more competitive and turbulent [2], with some calling for research to adopt a 'more encompassing, co-evolutionary perspective' [3, p. 242]. Co-evolution offers scholars the potential to draw from similar approaches taken in other areas of research beyond organization studies, 'integrating micro- and macro-level evolution within a unifying framework, incorporating multiple levels of analyses and contingent effects, and leading to new insights, new theories, new empirical methods, and new understanding' [8, p. 520]. A number of researchers have explored the notion of co-evolution at an empirical and conceptual level [9,17–19], with some recent accounts examining co-evolutionary processes in internationalization strategies [20], off-shoring of business services [3], networks [21] and growth of industries [22]. Indeed the notion of an organization being viewed as a complexity of interacting parts is not new to management research. Tushman and Romanelli [23] describe the evolution of the organization from periods of exploitation and convergence, to exploration and realignment. While the former is historical and path dependant, the latter is prospective and anticipatory of unseen futures. So during periods of relative 'calm' in the external world, strategy, structure, processes and values become aligned [23], as organizations establish and exploit organizational practices which are perceived to be aligned with the demands of the external world. These collective practices allow the organization to retain and exploit existing knowledge, but at the same time can result in a buildup of inertia, making subsequent change difficult [23]. So when the external world is perceived to have changed or in the face of a crisis [24], the alignment between established practices and the demands of the environment needs to be reordered and new knowledge and practices explored [23]. While the narratives differ, in these earlier accounts strategy, structure, processes and values are nonetheless seen to 'co-evolve' at multi-levels within and beyond the organization. Similarly, more recent work on organizational ambidexterity

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