

Chapter 5

Fostering Innovation and Creativity Through Systemic Design

Denis A. Coelho

Universidade da Beira Interior, Portugal

Tuiago E. P. Carrola

Universidade da Beira Interior, Portugal

Ana F. Couvinhas

Directors & CE, Portugal

ABSTRACT

Based on empirical studies carrying a common thread of design creativity as well as systemic analysis, interdisciplinarity's fostering of innovation is exemplified. The studies illustrate contexts for systems perspectives in design. A lot of transformation in socio-economic systems is taking place, individuals have a choice to either react to it as it happens or attempt to take the lead on change and position themselves in the frontline or ahead of the fundamental changes that are bound to occur. Designers are well versed in the knowledge and skills necessary to lead this transformational process, requiring forward looking, focusing on problems, working across disciplines, participating in teams and leading by example and inspiration, while adopting a systems perspective and focusing on people. Systemic analysis triggers design work, through the development of solutions, as illustrated in the two cases. One concerns sustainable solutions for water management in a community. The other focuses on the production system for a Portuguese semi-artisanal certified cheese.

INTRODUCTION

Contemporary ecology has emphasized the importance of boundaries and their role in the landscapes, as urban climate and urban watersheds studies demonstrate (Spirn, 2014; Cadenasso et al., 2003). Since the 1970s, Systems Theory and Complexity has been explored in science to provide a new framework for nonlinear, non-rational decision making and planning (Furlan & De Meulder, 2014). Nevertheless, this thinking has often been adopted superficially (Berger, 2009). The original systemic method, proposed by Alan Berger, entails that large-scale territorial dynamics, if properly understood, could guide design

DOI: 10.4018/978-1-5225-3878-3.ch005

projects and strategies, going beyond the traditional schemes (Furlan & De Meulder, 2014). Systemic design merges the existing territorial dynamics, with multi-layer strategies and historical transformations, understanding how natural and artificial systems dynamically operate at the regional and local scale, and how these are interrelated providing the basis for an innovative design (Berger, 2009). The theories about complexity assist the management of the entire communal and industrial systems and the design approaches support the planning of different divergent elements (Barbero & Tamborrini, 2015).

Some scholars have affirmed the need for innovative visualization and mapping techniques to identify and portray the interplay of natural and social processes that shape and structure the artificial environment and the territory. “For designers, new techniques of notation and representation are required. Conventional techniques are inadequate to the portrayal of time and change, and they encourage the continued focus on visible and static form” (Spirn, 1988). The construction of causal maps is a key instrument in a systemic design approach (Furlan & De Meulder, 2014).

Even though systemic innovation is not amenable to simple recipes or toolkits, given its complexity and its multi-faceted process, it may be driven by awareness in order to achieve the best possible result. Such is the scope of the systemic innovation process. Starting from the analysis of the complex interactions relationship between different actors (individuals, society, enterprise, culture, territory, etc.) and the related cultural, economic and community area or territory the aim is to unlocking and exploit the innate value of the context as a starting point (Gaiardo & Tamborrini, 2015). Given information and communication technologies and in particular, the ability to gather, analyze and disseminate large swaths of data and connect large numbers of people over broad areas a greater understanding of complex systems can be achieved (Coelho, Carrola & Covuvinhas, 2017). There is now a range of tools for mapping and better understanding systems that can give useful insights leading to innovation of those systems (OECD, 2014). This approach is a strategic way to face the design innovation activity, defined as the process comprising all essentials steps that lead to innovations generally involving all the internal sources of knowledge generation and learning and the organizational structure and processes of the people and organizations committed in the process (Filippetti, 2011).

The two case studies reported in this chapter illustrate diverse contexts for systems perspectives in design. A lot of transformation in socio-economic systems is taking place at a growing pace; hence, individual professionals have to choose to either react to it as it happens or to attempt to take the lead on change and position themselves in the frontline or ahead of the fundamental changes that are bound to occur. Designers are well versed in the knowledge and skills necessary to lead this transformational process, requiring forward looking, focusing on problems, working across disciplines, participating in teams and leading by example and inspiration, while adopting a systems perspective and focusing on people (Coelho, 2016). This chapter aims demonstrating how systemic analysis triggers design work, through the development of solutions, and this is practically illustrated in the two cases covered in this chapter. The first one concerns sustainable solutions for water management in a community. The other one focuses on the production system for a Portuguese semi-artisanal certified cheese: *Serra da Estrela* PDO cheese.

BACKGROUND

Biologist Edward O. Wilson has argued that consilience - the “jumping together of knowledge” across disciplines “to create a common groundwork of explanation” - is the most promising path to scientific advancement, intellectual adventure, and human awareness (Wilson 1998, p. 8). In a review by Rhoten

20 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

www.igi-global.com/chapter/fostering-innovation-and-creativity-through-systemic-design/190510

Related Content

Measuring Research Impact of Scholarly Publications Using Altmetrics: A Case Study of Thapar University

Shri Ramand Rudra Rameshwar (2017). *Scholarly Communication and the Publish or Perish Pressures of Academia* (pp. 205-223).

www.irma-international.org/chapter/measuring-research-impact-of-scholarly-publications-using-altmetrics/169463

Disaster Management in High Risk Regions: A Case Study of the Indian Himalayas Region

Bright Chinemerem Amajuoyi, Oguguo C. Njoku, Joachim Kodjo Arthur and Dilshad Sarwar (2020). *International Journal of Strategic Engineering* (pp. 59-71).

www.irma-international.org/article/disaster-management-in-high-risk-regions/243669

Perspectives of Use of Petri Nets in Collaborative Research

Vyacheslav Rogalchuk and Konstantin Solomin (2015). *Collaborative Knowledge in Scientific Research Networks* (pp. 371-385).

www.irma-international.org/chapter/perspectives-of-use-of-petri-nets-in-collaborative-research/119833

Sustainable Urban Development: Strategies To Support The Melbourne 2017 - 2050

Koorosh Gharehbaghi, Bambang Trigunaryah and Addil Balli (2020). *International Journal of Strategic Engineering* (pp. 59-72).

www.irma-international.org/article/sustainable-urban-development/255142

Hole Drilling Route Optimization in Printed Circuit Boards Using Far-to-Near Metaheuristics: Optimizing the Hole Drilling Route via Far-to-Near Metaheuristic

Souhail Dhoubi (2022). *International Journal of Strategic Engineering* (pp. 1-12).

www.irma-international.org/article/hole-drilling-route-optimization-in-printed-circuit-boards-using-far-to-near-metaheuristics/301568