

# Systematic Literature Review: Healthcare Organizations' Innovative Processes as Self-Organization and Emergence of Digital Service

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## ABSTRACT

This systematic literature review aimed to investigate how healthcare organizations' innovative processes of digital service design with stakeholders can be described by self-organization and emergence of complex adaptive system theory. The data of the publications was collected using a systematic research literature review method and analyzed with theory-based content analysis. The total of selected articles was 21. The reliability was strengthened through searching other references identified in the articles. The overlaps in literature of innovativeness and innovations, digital service design, and complex adaptive system theory showed their concordant characteristics. The innovative process of digital service design was described by theories and concepts related to complex adaptive system theory and other complexity approaches with an emphasis on user-centeredness. Stakeholder interaction is needed to achieve identifying barriers and benefits of success, and effective progress of an efficient innovation process.

## KEYWORDS

Complex Adaptive System Theory, Digital Service Design, Health Care, Innovation Process, Innovative Process, Patient Participation, Stakeholder Participation

## INTRODUCTION

Nowadays, digitalization and technology bring forth new challenges and opportunities for organizational innovativeness. Technological development has led organizations to an ongoing process of change. What has been reached is not enough to keep up in the long run. Innovativeness encourages creating a novel or enhanced activity. Innovativeness and the innovation process have taken on a new form with digital service design. Furthermore, there are changes in definitions of concepts of innovations and their deployment in the current situation. In the healthcare context, innovations can be classified as service innovations (Parris, Bouchet, Peachey, & Arnold, 2016) and more precisely, for the purpose of this systematic literature review, as digitally enabled service innovations (Lusch & Nambisan, 2015). According to current trends, healthcare service innovations have a clear connection to services with different technological innovations. Technology encounters major expectations, and its achievements have been radical in developing treatments and healthcare systems or at least renewed and intensified patient care.

Healthcare organizations function in different clusters: investors, suppliers, consultants, technology firms, and customers with cooperation of an organization's staff. The complex adaptive systems theory approach can be used to construe the understanding of these actors' cooperation

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and achievements. The approach can enlighten healthcare innovative activity in which innovations can evolve on the basis of the interaction and knowledge of stakeholders. Complex adaptive system theory and digital service design have the following elements in common: diverse participants in its operating environment, spontaneity, creativity, innovativeness, and emergence of novelty as the result of activity. Emergence is beforehand an unknown outcome; it may be achieved or not (De Wolf & Holvet, 2005), and as a such, it applies to healthcare technology and its innovative process because no one knows exactly where technological development can lead. The healthcare system is an appropriate context in which to diagnose sicknesses and developing healthcare processes is an ongoing necessity. Therefore, innovativeness, complexity, and new technological solutions are ongoing processes in the development of healthcare services. The aim of the study was to investigate digital service design as an innovative process based on complex adaptive systems theory. The knowledge of the ways that organizations, employees, and users interact and also, the descriptions of the specific tools and methods of users involvement in the development of new services are lacking (Wetter-Edman, 2013). In many studies, the complexity of healthcare is highlighted (e.g., Finchman, Hohli, & Krisman, 2011), but its meaning seems to be ambiguous and especially, how it evolves during the innovative process, how stakeholders of an organization self-organize, and what kind of emergence is accomplished. Most studies report on the results of interventions or the deployment of innovations, but more research is needed concerning the self-organizing that can lead to an emergence of digital service design (e.g., Poutanen, Soliman, & Stähle, 2016). Furthermore, the combination of emergence and self-organization is suggested to be a more promising approach than investigating them on their own in complex multi-agent systems (De Wolf & Holvet, 2005).

The research question of the systematic literature review was how healthcare organizations' innovative processes of digital service design regarding stakeholders can be described by self-organization and emergence of complex adaptive system theory. The sub-questions covered the main research question by asking how healthcare professionals, patients, and other stakeholders participate in an innovative process of digital services, and what are the benefits and barriers of the self-organization and/or emergence in a healthcare organizations' innovative process of digital service design.

## **DIGITAL SERVICE DESIGN AS INNOVATIVE PROCESS**

Designing digital services can be approached using different theories and methodologies. In the context of digital service design, methods of service design can be applied when developing, for example, digital devices with customers. Service design can be also related to several theories such as co-production and co-creation of value (e.g., Böhmman, Leimeister, & Möslin, 2014). Along with service design, new solutions, procedures, prototypes, and scenarios of services that can become innovations are created. Service design has been defined as “an emerging social phenomenon, thus the practice carried out by the designer, the requirements raised by the service users, client and other stakeholders, and the theoretical principle developed by researchers are all constructed on their particular positions, perspectives and experiences” (Han, 2010, p. 66). Creativity and innovativeness evolve from a novel perspective compared to traditional service planning. Previously, a limited organizational view was opened to a wider group of participants and with them, deviant, new creative methods in designing services.

Design processes share some common features, such as problem solving, analysis, design, implementation, and evaluation of an artifact (Hevner, March, & Park, 2004; Böhmman, Leimeister, & Möslin, 2014). More precisely, service design includes several stages—problem framing, collecting and interpreting information, ideation of a solution, development and evaluation of existing services, and/or designing a new service solution (Miettinen, Ryttilähti, Vuontisjärvi, Kuure, & Rontti, 2014). In scientific research, similar phases include defining research problem or question, data collection, choosing research methods, data analysis, interpreting results, and drawing conclusions. Digital service design can also be understood as a process of an innovation that has been described as the

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