Chapter 6
Modelling Patients' Contribution to Healthcare: A Dynamic Performance Management Application

ABSTRACT

This chapter proposes an application of simulation modelling to frame the relationships between healthcare, patient organization management, and patient co-created healthcare. For the purpose, it presents a case study within the Italian context, for which it adopts a methodological approach combining performance management and system dynamics. After background information, the chapter introduces the methodology and explains the modelling steps, undertaken assuming the privileged perspective of a patient organization. The model building goes by progressive approximations. A tailored dynamic performance management framework identifies key variables and links within the system. Then a stock-and-flow structure deepens the analysis by depicting processes of accumulation of material, money, and information; a comprehensive loop analysis describes the system's dynamics in terms of interacting feedback structures. Finally, quantitative simulations concerning the mutual development of patient organizations and healthcare allow graphing behavior patterns according to alternative scenarios.

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BACKGROUND

This chapter investigates patient-aided healthcare through a methodological approach mixing performance management (PM) and system dynamics simulation modelling (SD), to build a dynamic performance management system, or DPMS (Bianchi, 2010; 2012). Recently there was a progressive shift in the definition and measurement of healthcare quality, routed towards patient-centeredness. Patient-centered clinical decisions are the ones capable to reflect informed patients' needs, values, and preferences, in line with a biopsychosocial perspective (Scholl *et al*., 2014). This concept was associated with improved clinical outcomes, efficiency, and patient satisfaction (Rathert *et al*., 2013). For these reasons, it is targeted by scholars, policy makers and providers all over the World, striving to find indicators to measure healthcare quality according to patients (Selby & Lipstein, 2014), in the attempt to develop models of 'good healthcare' from the patients' perspective (McCaffrey *et al*., 2018). Although traditional performance management techniques such as the balanced scorecard (Kaplan & Norton, 1992) in the past have been applied to healthcare organizations (e.g. Inamdar *et al*., 2000), they fail to capture the multi-dimensionality of healthcare quality. Indeed, such tools are characterized by stativity and are not able to represent the feedback processes involving strategic assets, performance drivers and outcome indicators (Bianchi, 2012).

Quality cannot be assessed just looking at data from administrative or medical records alone, rather requiring direct inputs from patients (Sepucha *et al*., 2004). The mere implementation of electronic health records is not a patient-centered tool, unless it works for patient-clinician relationships, helping people to know more about their health conditions, and facilitating involvement in their own care (Epstein, & Street, 2011). Then healthcare systems and providers should be modified by mean of a cultural organizational change, from clinician to patient focused (Luxford *et al*., 2011; Berghout *et al*., 2015).

In order to deal with these challenges, this chapter pairs performance management with system dynamics (Forrester, 1961; Sterman, 2000), creating synergies between PM's rationale and the potentialities of SD in terms of insight models and simulated policy experiences. Indeed, system dynamics is a flexible methodology, so that it can help to describe multidimensional phenomena such as healthcare, organizational management, learning processes. Thus, the mapping and simulation tools provided by SD can be routed to