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Editorial

Introduction to the Special Issue on Systems Thinking and Strategic Management

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This paper summarizes the aim of the Special Issue and the insights from the papers submitted and accepted for it. On the one hand, systems thinking (ST) refers to perspectives, concepts, frameworks, approaches, methodologies, and interventions focused on understanding the interrelationships between entities or parts generating emergent behavior. On the other hand, strategic management (SM) has different schools of practice related to prescribing successful strategies (prescriptive schools) and to describing unstructured processes (descriptive schools), focusing on the process of developing strategies (strategy process) as well as the types of strategies (strategy content).

This special issue invited scholars to document the significant contribution of ST to SM and propose new avenues for research into its integration, such as the potential roles of ST in analyzing complex strategic problems, fostering strategic decision making through ST-assisted approaches such as games, embedding ESG in an organization's strategy, and identifying approaches to use ST.

The Special Issue has 13 papers, which we structured into different sections. Section 1 introduces two papers discussing general frameworks to embed ST into SM. One of the criticisms to ST is that its approaches are too abstract and general. Consequently, we have three sections showing applications of ST using recognized ST methods or methods that adopt some of the particularities of ST organized by levels of systemic intervention: large systems such as innovation systems, meso-level ones, like organizations, and micro-level ones, such as decision makers. Section 2 discusses ST supporting innovation. Then, Section 3 synthesizes ST interventions into organizations, and Section 4 presents ST-assisted approaches to enhance decision making. The final section discusses a paper presenting principles for ST practices.

1. General Frameworks

Kunc (Contribution 1) is the only paper that explicitly integrates ST with SM. After a review of the field of ST and SM, he provides an integrative framework presented in Table 1.

The first concept is the type of system implied in the definition of the school of SM, which can be mechanical, organismic, or social. The first three SM schools, together with the environmental school, have a conceptualization of organizations as mechanical systems with regular behavior shaped by internal structure and economic laws easily shaped into the strategies identified by the main actors. The other schools have a mix between organismic and social depending on the role of people in shaping the development of strategies through visioning activities, learning processes, power struggles, and cultural influence. The level of complexity indicates the conceptualization of the systems underpinning the formation and implementation of strategies. Schools mostly driven by individual actors have a simplistic concept of the organization; e.g., SWOT analysis is a very simplistic tool used to design strategies. However, most of the schools tend to have a complicated or complex perspective, albeit implicit, in their conceptualization of the system due to multiple actors involved in the process, the existence of different forces, the amount of

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information to be processed, etc. Interestingly, complexity is not addressed in ST in terms of the content of strategies. A dimension aligned with the second term is that of the impact of divergent values, beliefs, and interests among the stakeholders in the system, such as unitary/pluralist/coercive, which tend to be recognized in schools that consider the impact of people on the process, whether pluralist or coercive, as either positive or a source of struggle. For formal schools, organizations are highly malleable. The fourth term, functionalist/structuralist/interpretative, provides a potential classification of the ST approaches that can be employed considering the type of system and the complexity. The schools that tend to be more analytical in their strategic processes seem to be better served by functionalist or structuralist ST approaches. On the other hand, schools that recognize the role of people can benefit from interpretative ST approaches, but with a caveat, since it depends on the role of the central actor. The last line includes the different ST methods that can be associated with or employed in each school of strategy. Since there is more than one method in each school, the best approach to using ST with SM is methodological pluralism, as suggested by Contribution 2 which is the combination of more than one ST method with SM methods depending on the step of the strategic development process, the organizational situation, and other factors which should be considered.

Contribution 2 proposes a "Systemic Multi-methodological Framework" for multi-methodological management science/operational research (MS/OR) interventions. See Figure 1 from Contribution 2. The proposed framework is like a theatre layout, where a systemic intervention is enacted and operated in practice, with a stage and the audience facing each other and separated by the main curtains, which separate the actors and the audience as well as dividing the real world from the systemic world. The first column outlines Jackson's taxonomy of "Systems", namely "complex", "complicated", and "simple". The other column represents Habermas' worlds, namely "Social", "Personal", and "Material". Supporting the columns are two "walls": On the left-hand side of the stage, we see Jackson and Key's SOSM [1] (with some suggested systems methodologies), and on the right-hand side of the stage, Mingers' multimethodological framework/map is exhibited [2], where a combination of methodologies/methods is selected when intervening within the context of Habermas' worlds (social, personal, and material) [3]. The interaction between the methodologies contained on the "bricks" of these two walls informs the effective combination of methodologies to address problems. The stage of the theatre contains three notional subsystems: the problem content system (PCS), the intellectual resources system (IRS), and the intervention system (IS).

In combination, the frameworks proposed by Contribution 1 and Contribution 2 can become useful guides for ST practitioners and scholars operating with strategic issues using multiple ST.

Table 1. ST analysis of the strategy schools and a potential matching of ST methods with each of them (from Table 2 in Contribution 1).

Concepts	**Design**	**Planning**	**Positioning**	**Entrepreneurial**	**Cognitive**	**Learning**	**Power**	**Cultural**	**Environmental**
Type of system	Mechanical	Mechanical	Mechanical	Social	Mechanical/ Organismic	Organismic/ Social	Social	Social	Mechanical
Complexity	Simple	Complicated/ Complex	Simple	Simple	Complicated/ Complex	Complicated/ Complex	Complicated	Complicated	Simple/ Complicated
Unitary/Pluralist/ Coercive	Unitary	Unitary/ Pluralist (if participative)	Unitary	Unitary	Unitary/Pluralist	Unitary/Pluralist	Coercive	Pluralist/ Coercive	Unitary
Functionalist/ Structuralist/ Interpretative	Functionalist/ Structuralist	Functionalist	Structuralist	Structuralist	Structuralist/ Interpretative	Structuralist/ Interpretative	Interpretative	Interpretative	Structuralist
ST Methods	SE/SA/OR/ VSM/SD/VM/ STS/SCA	SE/SA/SD/ VSM/IP/VM/ RA/OR/SCA	SE/SA/ SD/RA/OR	SD/SSM/ SODA/SCA	SD/SODA/SSM/ SAST/CSH	SD/SODA/SSM/ SAST/CSH/TS	CSH/CST/SI/ TS/STS/SD	CSH/CST/SI/ TS/STS/SD	SE/SA/OR/ VSM/SD/VM/ STS/SCA/CST

Note: VSM (Viable System Model), STS (Socio-Technical System), SD (System Dynamics), SE (Systems Engineering), SA (System Analysis), OR (Operational Research), VM (Vanguard Method), IP (Interactive Planning), SSM (Soft System Methodologies), SAST (Strategic Assumption Surfacing and Testing), CSH (Critical Systems Heuristic), TS (Team Syntegrity), CST (Critical System Thinking), SI (Systemic Intervention), SODA (Strategic Options Development Analysis), SCA (Strategic Choice Approach), RA (Robustness Analysis).

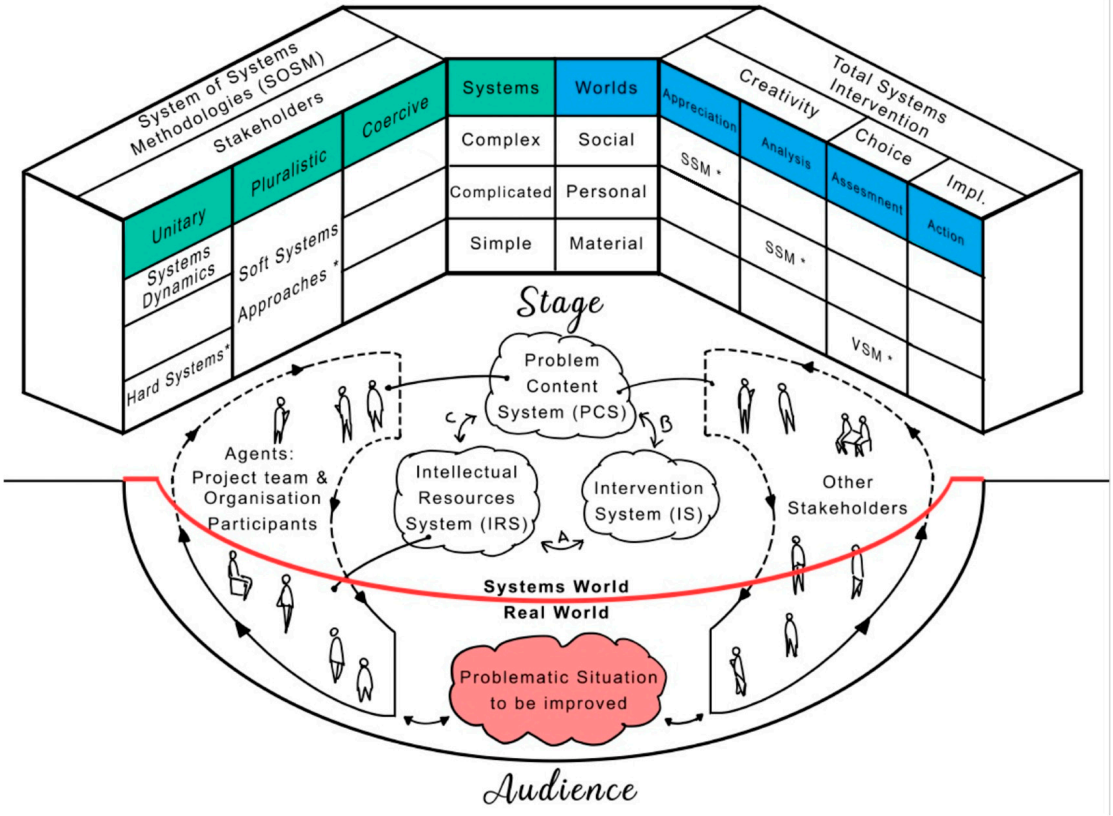

Figure 1. Multi-methodological ST intervention framework: the "theatre" (from Figure 3 in Contribution 2).

2. Innovation

Innovation can be observed at multiple levels, e.g., the nation, region, enterprise, and team levels, which raises important questions regarding philosophical perspectives on the analysis of systems, including decision-making processes and the implementation of policies identifying key influences [4,5]. This variety of perspectives can be observed in the next set of papers in the Special Issue.

Contribution 3 employs SD to explore the impact of smart technologies on regional development. SD is an experimental tool for conducting extensive what-if scenario analyses to understand the influence of smart technologies on the dynamics of the regional innovation system. This is an example of a top-down, mechanistic, unitary approach to conceptualizing a system. The documentation of the assumptions and equations for the model provides useful insights into the mental models employed to conceptualize the system. Extensive what-if scenarios offer a top-down perspective on interventions in the system.

Contribution 4 develops an evolutionary game model comprising two key actors in a national innovation system: government and contractors. Typically, game theory models are not part of ST tools and methods. However, they provide a perspective, which is strongly influenced by economic assumptions about actors' behavior, interests, and beliefs, on a system where actors engage in interactions over time. In this paper, the actors are responsible for developing big-science infrastructures, e.g., research labs, to support the development of science and technology. Basically, insights are related to "optimal" choices on the strategies used to manage the relationships among the actors, such as encouraging specific behaviors. The paper is another example of a top-down, mechanistic, unitary approach to conceptualizing a system.

Contribution 5 focuses on the adoption of technologies in enterprises. It provides a systematic review of literature in this area to find evidence of ST used in research related to this area. Their findings indicate there is not sufficient evidence of the application of ST on

readiness and process models related to the adoption of technologies. In their conclusions, they suggest that the Technology, Organization, and Environment (TOE) model existing in the literature can be used as a holistic analysis tool for the adoption of new technologies. Systematic reviews are strongly dependent on the search keys and databases employed, together with the inclusion and exclusion criteria, which may explain the lack of examples using ST methods, e.g., SD, as discussed in [5].

3. Business Issues

Both Contributions 6 and 7 present applications in a healthcare setting, which is one of the most complex systems. Contribution 6 offers a framework called "Integrative Systems Methodology" that is a combination of VSM and SD, which complement each other. They indicate it as a heuristic, which helps problem solvers to enhance their behavioral approaches to address complex problems. They conclude that patients should be the focus of systemic interventions in health systems, which should be designed in a systemic way. Contribution 7 uses SSM to support dolphin-assisted therapy for neurodivergent patients. They select SSM due to the number of high social components of the system and the organizational complexity of multiple stakeholders with multiple interests. Both papers are examples of systems conceptualized as pluralist that are social, with complex structures that require accommodation.

Contribution 8 presents a non-traditional ST approach, an analytical hierarchy process, which may share some of the concepts related to ST, such as pluralism and multiple perspectives, using a structured approach. After preparing a list of factors affecting the performance of a sales organization, participants perform a pairwise comparison of them to identify the critical ones. On the other hand, Contribution 9 explains a project to improve the supply process in terms of packaging usage using SD. The project involves system mapping, casual diagram construction, and model development and simulation. Then, they present the model to the users through a graphical user interface so that they can engage with the SD representation of the system and learn the dynamic complexity embedded in their supply chain. Both approaches consider a mechanistic representation of the system that has been shared with the stakeholders in the systems.

4. Decision Making

In this section, three papers provide extensive evidence of how ST can improve and analyze decision making in complex environments. Contribution 10 offers an approach called "Dynamic Performance Management" (DPM) that can improve the performative use of performance information in a socio-economic system. DPM is based on an SD-based interactive learning environment. Their findings suggest that DPM can help stakeholders in a socio-economic system to (re)conceptualize the social reality in which their institutions operate with a more dynamic perspective. Similarly, Contribution 11 explores and discusses the role of ST- and SD-assisted games, or an interactive learning environment, in enhancing critical thinking skills in learners. Their approach can facilitate and enhance the acquisition of critical thinking skills in learners, especially project management skills.

Contribution 12 discusses ST and behavioral aspects influencing decision makers to fail to foresee potential extreme black swan events. They called the confluence of these aspects "hedgehog cognitive thinking style", which is an oversimplification of uncertainty and an unquestioned, top-down, reference narrative. This is a very interesting study that can explain the reasons for the low adoption of ST and its consequences on organizations, especially when they may be at risk of extreme events.

5. Systems Thinking in Practice

Contribution 13 provides a set of ST principles to support practitioners in managing the large, and increasing, number of ST tools, methods, and approaches (see Table 1 for a list). It argues that managers and decision makers require principles that are more accessible than the detailed instructions or laws of conventional ST approaches. One interesting aspect

of this article is the presentation of the uses of systems as either ontological devices (where systems are real-world entities that can be engineered, which can be close to the first schools of SM) or epistemological devices (where situations are explored using systems as learning devices, which may be associated with the remaining schools of SM).

A summary of the principles for ST in practice (STiP) are:

Relational STiP: It relates to the process of framing an understanding of the interrelationships and interdependencies of the complexities in the real world through "factual" judgments, rather than entities in isolation, to avoid narrow-minded reductionism. It employs techniques to map the systems such as casual loop diagrams, rich pictures, etc.

Perspective STiP: It suggests engaging with multiple perspectives towards framing mutual understanding across different disciplines and perspectives to cultivate "value" judgements and avoid dogmatism.

Adaptive STiP: It involves transcending disciplinary boundary judgments through both boundary reflection and boundary discourse to learn from the appreciation of the system.

To summarize, this editorial starts with frameworks to facilitate the use of ST in SM, then presents evidence of the practice at three levels—the macro-, meso-, and micro-levels—and concludes with key principles that should be employed in ST practice.

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