Research Article

INTERNATIONAL JOURNAL OF ENGINEERING BUSINESS MANAGEMENT

International Journal of Engineering Business Management
Volume 15: 1–16

DOI: 10.1177/18479790231202420
journals.sagepub.com/home/enb
Sage

The systemic tenets of the key supply chain social responsibility approaches

Mohamed Basta[1], **James Lapalme**[1] and **Marc Paquet**[1]

Abstract

Social responsibility issues keep reoccurring despite the popularity of numerous approaches perceived widely as adequate. In this paper, the authors conducted a systematic literature review to explore this phenomenon from a systems thinking standpoint. The findings revealed that each approach is founded on a different systemic paradigm, makes different assumptions on the nature of social responsibility issues, and has different objectives when resolving them. Therefore, employing any of these approaches alone will certainly fail given their underlying systemic limitations. The findings also revealed that these approaches are complementary from a critical systems thinking perspective, hence, researchers and practitioners can use their tools and methods together in the form of tailored interventions to better address efficiency, subjectivity, and fairness when resolving social responsibility issues. This paper concludes by proposing a practical framework based on critical systems practice which encompasses four systemic paradigms allowing the inclusion of a spectrum of perspectives, and assumptions.

Keywords

Supply chain management, critical systems thinking, corporate social responsibility, social life cycle assessment, systematic literature review, JEL Classification, M14

Date received: 7 April 2022; accepted: 20 August 2023

Introduction

Social responsibility is the responsibility of organizations for the impact of their decisions and activities on society.[1] Such responsibility is maintained through ethical behavior consistent with society's well-being, accounting for stakeholder expectations,[2] and conforming to applicable laws and international norms.[3]

A social responsibility mess is a failure of social responsibility at one or more levels, creating problems not only to the offending organization but, more importantly, to its supply chain and the society of which it is part. Such messes have resulted in severe consequences to the supply chains that endured them, ultimately impacting revenues and threatening all member organizations' growth prospects. Therefore, from a supply chain perspective, the need to prevent and manage such messes is real, urgent, and justifiable.[4]

The term "Mess" was coined by Russ Ackoff[5] to denote complex problem situations that are characterized by their interdependent and ill-structured nature. Messes occur when rational actors exhibit behavior of collective self-damage. Resolving messes requires collective action following a systemic approach, i.e., addressing the whole system instead of one or more of its parts.

In a supply chain context, social responsibility messes are incredibly complex because supply chains are complex

[1]Systems Engineering Department, École de Technologie Supérieure, Montreal, QC, Canada

Corresponding author:
Mohamed Basta, Systems Engineering Department, École de Technologie Supérieure, 1100 Notre-Dame St W, Montreal, QC H3C 1K3, Canada.
Email: mohamed.basta.1@etsmtl.net

systems: firms within a chain have mutual relationships, and all depend on each other to secure critical resources, products, services. A supply chain's size and web of connections implies that it operates within complex social contexts, as its business necessarily impacts a wide range of places and peoples. Understanding these social contexts is crucial when it comes to avoiding or addressing social responsibility messes. This is where conventional supply chain management fail and the need for dedicated approaches capable of perceiving and addressing such multidimensional complexity becomes clear.

Acknowledging that social responsibility messes are serious material risks directly impacting bottom lines, and that traditional supply chain management techniques focusing solely on business priority were not adequate to anticipate and handle them, supply chains have turned to various mainstream approaches for prevention and remediation.[6] Through such approaches, supply chains aim to establish more responsible policies, governance, and management practices. However, for this to work, such approaches must be holistic and enable the consideration of all stakeholder viewpoints to reach sufficient multifinal outcome.[7] Therefore, systemic holism becomes necessary to outperform one-sided mono-disciplinary approaches and methods.[8] Holism outperforms reductionism since the latter fails to predict and manage higher-level patterns.[9] Holism means that a system's properties cannot be determined or explained by its parts alone. Instead, the system as a whole determines how the parts behave.[10]

Furthermore, the closer such messes are inspected, the more it becomes clear that a larger group of stakeholders are implicated.[11] Supply chain stakeholders include community members, shareholders, employees and their families, customers, suppliers, business partners, regulators, governmental and non-governmental organizations, and international agencies.[12] More importantly, stakeholders are diverse in their backgrounds, worldviews, and perspectives.[13] Thus, supply chains and their stakeholders form incredibly complex systems; resolving social responsibility messes is correspondingly complex. Therefore, resolutions require systemic approaches, that is, approaches possessing systems thinking tenets capable of addressing these complex systems.[14]

Indeed, given the complex nature of social responsibility messes, the high degree of structural complexity and change within the supply chain and its environment, and the diversity of its stakeholders,[15] it is practically impossible—from a critical systems thinking standpoint—for any single approach or methodology with a particular perspective to offer a viable solution.[1] Therefore, any solution addressing supply chain social responsibility messes must be holistic and creative: holistic by accounting for the entire supply chain, not just one or more of its member firms; and creative by embracing the multi-perspectival nature of the messes of interest.[16]

Basta et al.[17] conducted a mapping study of the supply chain social responsibility literature to uncover what systemic paradigms it embraced. The authors revealed that this literature was mostly Interpretive, one third Functionalist, and one tenth Emancipatory. More importantly, the authors revealed the innate inability of most of this literature in offering creative and holistic solutions, i.e., it can only resolve the subset of social responsibility factors it perceived, which explains at the literature level why such messes persist and resurface. Hence, the gap this paper addresses is why a single social responsibility approach cannot effectively address supply chain social responsibility messes from a systemic perspective, and can their tools and methods be combined using a systemic meta-methodology to design better interventions.

Therefore, the goal of this paper is to understand why supply chains continue to endure social responsibility messes despite their adoption of social responsibility approaches. The originality of this paper lies in making both researchers and practitioners aware of each of the approaches' systemic strengths and weaknesses permits better judgment of their suitability for addressing a social responsibility mess, particularly in a supply chain context, while making it clear when to expect each approach to fail, in what way, and what can be done in such cases.

The main contributions of this paper are threefold: Firstly, it uncovers the top three social responsibility approaches; Secondly, it provides a novel systemic analysis these approaches to reveal their systemic paradigm pertinences, this brings into light each approaches' strengths and weaknesses. Thirdly, it shows how the tools and methods from each of the approaches can be used jointly to deduce better interventions based on multiple systemic paradigms.

Literature review

Supply chain social responsibility experts are increasingly implementing initiatives to address social responsibility incidents that impact bottom lines,[18] supply chain sustainability strategists are increasingly engaging in initiatives to address them.[19] Practices like worker abuse, factory collapses, and corporate duplicity had led to protests, reputation damage, and targeted regulations.[20]

The following subsections further revisit the literature on systems thinking, supply chain social responsibility and the role of systems thinking in the context of this paper.

Systems thinking

Systems thinking is a holistic analysis approach that considers emergent complex systems, such as supply chains, as wholes rather than its individual parts or their relations. It recognizes that a system is more than the sum of its parts, and thereby rejects simple solutions to complex problems, embracing holism and creativity instead. This is contrary to

reductionist approaches, where a system is broken down into its constituents to understand and fix the whole.[9] It is interesting to know how little systems thinking is used in the social responsibility literature[14]; it was reported that less than 9% of the social responsibility literature uses systems thinking.[21]

Critical systems thinking is of special interest to this paper. Jackson[22] discussed this concept as part of their seminal work on the System of Systems Methodology (SOSM) presented in detail in a later section in this paper. The SOSM came as natural development from the work of other authors who made significant contributions to the complementary systems thinking tradition. For example, Flood and Romm[23] showed how Soft and Structural systems thinking methodologies could be used in cases of coercion regardless of their innate theoretical purpose. The authors introduced the concept of the Oblique use of systemic methodologies to overcome special circumstances which hinder the use of direct emancipatory systemic methods which could be perceived as confrontational, and instead used systemic methodologies from a less direct angle that are sensitive to political dynamics to rally stakeholder support and commitment.

Other important contributions to complementary systems thinking are the works of Mingers and Brocklesby[24] and Midgely.[25] These two papers introduced the concepts of Multimethodology and Mixing Methods; Multimethodology advocates for the use of multiple systemic methodologies in tackling the same problem situation to account for the richness of the real world and better assist through the stages of an intervention, the authors also presented a framework that highlights the strengths of different systemic methodologies which assists in constructing multimethodology designs. Mixing Methods on the other hand, advocates for mixing methods and tools from different systemic methodologies belonging to the functional (first wave) and interpretive (second wave) traditions while keeping value and boundary judgement consistent in a given intervention.

Systems thinking and social responsibility

Reviewing the literature, very little use of systems thinking in the context of social responsibility can be found. For instance, Molderez and Ceulemans[26] used rich pictures in the form of art paintings to foster soft systems thinking competences and develop holistic solutions in the context of Corporate Social Responsibility (CSR). The authors reported that soft systems thinking and its tools allowed a better understanding of CSR related issues, their holistic nature, and interconnectedness.

Moreover, Waller[27] advocated for the use of systems thinking in turning social responsibility into a mainstream supply chain activity, instead of a luxury affordable only by big-brand firms. The authors[27] advocated that holistic systems thinking, because of its ability to enable collaboration and innovative strategic planning, is at the heart of supply chain social responsibility initiatives and is crucial to their success. In particular, the authors highlighted the importance of interpretive and emancipatory systems thinking for stakeholder management and conflict resolution, in order to minimize the supply chain's costs.

Additionally, Starik and Kanashiro[26] used system dynamics to model and address the interconnectedness between social sustainability components—people, organizations, society, and environment—across temporal and spatial dimensions. The authors argued that only structural systems thinking, as opposed to traditional management theories, could offer solutions appreciated by all the stakeholders involved.

Interestingly, some authors attempted to make use of relatively modern technology to manage a supply chain's impact across the life cycle of a product or service. For instance, Kopanaki et al.[28] used Blockchain technology to track food waste in the hospitality industry. The goal was to reduce costs and, more importantly, attract more clients by offering a differentiated service where social and environmental sustainability are core to an organization's business model. Moreover, it is worth noting that some forms of novel social responsibility models were attempted and showed considerable success such as the social supermarkets-model implemented in central Europe whose purpose is to promote resource efficiency and waste reduction in the food supply chains allowing a wider access to food to those in need.[29]

Finally, Cordoba and Tim[30] reemphasized the importance of considering different stakeholder worldviews and various perspectives when dealing with CSR. The authors explained that CSR means something to everyone but not the same thing to everyone, consequently making the process of prioritizing social responsibility messes and deciding on actions prohibitively challenging. The authors explained that this confusion led many organizations to engage in CSR without necessarily assessing its fit to the problems at hand. However, as opposed to considering CSR and Systems thinking as two separate approaches that could help with handling the complexities of social responsibility, this paper uncovers the systemic tenets of CSR itself and explains where it sits in the systems thinking paradigm spectrum; this is presented in detail in the next sections.

Paradigms

Paradigms are an important component of systems thinking, as the different systems thinking methodologies are founded on different paradigms. A paradigm is a grouping of ideas, backgrounds and beliefs that shape conduct. Different paradigms are founded on different assumptions, which means that the same problem can be viewed from different

perspectives and inspected by a variety of different methods with distinct theoretical backgrounds by approaching it from different paradigms.[31] Importantly, each paradigm holds that it offers the best account of observed reality, and therefore they are inherently in conflict with each other. It follows that different systems thinking methodologies are also in conflict, due to their underlying paradigms.

This paper addresses four paradigms: Functionalism, Interpretivism, Emancipation, and Postmodernism. These four paradigms were selected because they work well with the SOSM. Moreover, limiting the scope of this paper to only these four paradigms was also in accordance with the resources available to conduct this research paper. Functionalism is concerned with ensuring that everything in a system is functioning well while promoting efficiency, adaptation and survival. Functionalism assumes that the inner workings of a system can be modeled using mathematical techniques to understand the nature of its parts. Conversely, interpretivism believes that systems result from people with different purposes interpreting the same situations according to their different backgrounds and worldviews. Interpretivism is concerned with finding where such interpretations overlap so that collective purposeful activity becomes possible. Emancipation seeks to emancipate oppressed individuals and groups who are participants of a given system, and to manage and reveal forms of power that it considers unlawfully used. Finally, Postmodernism challenges the idea that systems can be fully understood. Postmodernism takes a less serious view of systems and stresses having fun, implementing what feels right, embracing conflict, and encouraging verity and diversity.[22] Postmodernism rejects the idea that a system can be steered to a desired state by following one or more systems thinking methodologies, but instead advocates for a best-can-do approach that acknowledges limitations and constraints.

To put it differently, each paradigm represents a lens or frame of reference through which we can understand how each of the social responsibility approaches engages messes, the supply chain, and the social context.[32] For instance, some approaches might define the messes of interest as optimization issues, whereas others might define them as power-struggles. These understandings naturally shape actions accordingly. Therefore, it is important to be aware of the frame of reference when addressing supply chain social responsibility messes.[32]

In their influential paper, Jackson and Keys[33] presented the SOSM of problem-contexts. The authors used this framework to study the interrelationship between Operational Research and other systemic methodologies. Problem-contexts are abstractions of the stakeholders involved and the systems bearing the problem. The authors showed that different problem contexts require different methodologies, and that mismatching hinders problem-solving. Nevertheless, the SOSM allows for avoiding such discrepancies given its core principle that different methodologies have different capabilities, and no one methodology can fit all circumstances.

Jackson[22] expanded the SOSM framework and used it to classify various systemic methodologies. The SOSM makes it clear that difficulty in addressing problem-contexts results from their increasing complexity, change, and diversity which could be studied along two axes: the size and structure of a system; and the compatibility of the views and objectives of the systems' participants; stakeholders. These two axes of "systems" and "participants" form a grid that constitutes a number of problem-contexts called ideal-types. In this grid, the vertical axis represents a range of system types from simple to extremely complex, whereas the horizontal axis represents the types of relationships between the participants, which could be "unitary", "pluralist", or "coercive". In consequence, the two axes yield six ideal-types: simple-unitary, simple-pluralist, simple-coercive, complex-unitary, complex-pluralist and complex-coercive. To resolve messes, different systemic methodologies, and management methods, span one or more of the these ideal-types.[16]

Paucar-Caceres and Wright[34] proposed a framework bases on similar paradigms to reflect on their development in information systems in contrast to management science. The paradigms were: positivist; interpretive; pluralist; and constructivist. The authors outlined each paradigm and investigated how each handled the concepts of system, organization, management, and information, and suggested a list of management science systemic methodologies pertinent to each of these paradigms. The authors found that information systems is shifting from positivistism to interpretivism, followed by critical and constructivist discourses.

Table 1 provides an overview of the four paradigms. "System complexity" refers to the degree of complexity that the paradigm can manage, and stems from the number or parts in a system, the nature of their interactions, and their relationship with the surrounding environment. "Participants' backgrounds" refers to their beliefs, points-of-view, and desired outcomes. Each paradigm makes assumptions about how compatible these are. "Consensus possibility" is the chance of finding intersections in viewpoints and objectives across stakeholders, which will allow plans to be sketched and commitments to be made. "Goal" is what each paradigm hopes to achieve.

Supply chains and sustainable supply chain management

A supply chain is the amplitude of activities performed and resources consumed to yield a product or service from concept to consumption and beyond.[35] From a sustainability perspective, there exist two types of supply chain designs:

Table 1. Characteristics of the systems thinking paradigms. Adapted from Jackson.[22]

	System complexity	Participants' backgrounds	Consensus possibility	Goal
Functionalism	Simple, complex	Compatible	Granted	Easily identifiable. Aims for optimization
Interpretivism	Simple, complex	Varied	Mostly achievable	Difficult to define. Small agreements allowing progress
Emancipation	Simple	Divergent	Difficult	Empower who are affected by decisions they do not make
Postmodernism	Complex	Ranges from compatible to highly divergent	Simple to difficult to reach. Accepts that this not always possible	Surface suppressed viewpoints. Encourage diversity. Achieve small improvements that feel right

open; and closed. Closed loop supply chains are distinguished by having formal procedures for recycling their products back into the system along with raw materials.[36]

In their never-ending pursuit for efficiency, supply chains developed into large and highly complex systems that are global in nature.[37] Contemporary supply chains comprise numerous companies with complex relations between and within them, and vast amount of information is used for control.[38] This came because of them being in direct competition with one another for growth and revenue in order to ensure the continuity of their member firms.[39] Nevertheless, the gains in efficiency usually came at the expense of the stakeholders in its sphere of influence including employees and surrounding communities,[12] consequently leading to rising social responsibility incidents.[40]

Lambert et al.[41] define supply chain management as integrating corporate procedures through the establishment of business processes with and across member companies of the Supply Chains. This definition acknowledges to the complex nature of supply chains and the diversity of stakeholders but is fundamentally focused on the composition of the supply chain and how optimization should only be driven by business priorities. Moreover, Lambert et al.,[42] Beamon,[43] and Mentzer et al.[44] all concur that supply chains are structured in complex networks of business entities contributing to the flow of material, information and finances upstream and downstream.

The literature categorizes supply chain complexity into three groups: dynamic; static; and decision-making. Static complexity is concerned with the structure of the supply chain, the number and variety of its components and the interactions between them. Dynamic complexity focuses on the notions of time and randomness in the supply chain such as its operational behavior and its relationship with the environment. Decision making complexity involves taking into account both the static and the dynamic complexity aspects in order to make sound decisions. To adequately manage a supply chain, a management method that can understand and handle such types of complexity is necessary.[38]

In discussing the sources of uncertainty in the supply chain, Kytle et al.[35] emphasized that its complex structure is one of the major drivers making risk management a considerably challenging undertaking. Lambert et al.,[42] described the supply chain as a highly complex systems and identified its members, structural dimensions and the types of process links as causes of this complexity.

Therefore, it is difficult to ensure social and environmental integrity across the supply chain.[12] This substantial supply chain complexity in both structure and stakeholder diversity brought forth a new set of challenges, amongst which is the challenge of social responsibility.[45]

Accounting for stakeholder interest is a steppingstone for serious social responsibility initiatives, as stakeholders are considered essential in identifying the goals, priorities and potentialities of any supply chain initiative that includes social responsibility. Stakeholders can be categorized into focal firm stakeholders, supply chain stakeholders and stakeholders beyond the supply chain such as local communities.[46] Moreover, stakeholders can monitor and hold supply chains accountable for behavior they perceive as socially irresponsible.[20]

It follows that the numerous stakeholder types and their diverse nature further exacerbates the complexity of supply chain social responsibility issues and messes.

Furthermore, any approach claiming to be viable must account for all distinct realities of the messes of supply chain social responsibility, i.e., be of a critical nature. These realities can be catalogued into six different types: simple-unitary; simple-pluralist; simple-coercive; complex-unitary; complex-pluralist or complex-coercive. The six reality-types reflect assumptions about the messes of interest that could be further grouped into four paradigms: Functionalism (simple-unitary and complex-unitary), Interpretivism (simple-pluralist and complex-pluralist), Emancipation (simple-coercive) and Postmodernism (complex-coercive).[47]

Research questions

The aim of this Systematic Literature Review (SLR) is to aggregate evidence to answer this paper's main question: why

do supply chains continue to endure social responsibility messes despite their adoption of social responsibility approaches?

Given the broad nature of the question, it was divided into the following sub-questions:

RQ1. What are the top supply chain social responsibility approaches?
RQ2. To what extent is CSR underpinned by systems thinking perspectives?
RQ3. To what extent is SLCA underpinned by systems thinking perspectives?
RQ4. To what extent is SA8000 underpinned by systems thinking perspectives?
RQ5. Are the top three supply chain social responsibility approaches founded on multiple systemic paradigms?
RQ6. Are the top three supply chain social responsibility approaches capable of addressing all factors of a social responsibility mess from a systems thinking perspective?
RQ7. Can the top three supply chain social responsibility approaches be used in tandem in a Critical System Practice (CSP)-like intervention?

It is worth noting that it was only after the answer to RQ1 was available that RQ2, RQ3 and RQ4 took their final form in terms of naming specific approaches.

Methods

This study set out to uncover how three selected social responsibility approaches differ from each other, from a critical systems thinking perspective. The approaches analyzed are CSR, Social Life Cycle Assessment (SLCA), and Social Accountability 8000 (SA8000). These approaches are the most common, giving them prominence and further adoption in academia and industry circles alike.[21]

This study used a SLR to answer its research questions. An SLR is a secondary study that finds and aggregates evidence from a group of primary documents to answer specific research questions. This method has a clear process with well-defined steps and a high degree of rigor, thereby ensuring internal and external validity.[48]

Unlike Basta et al.,[17] where the SOSM served as a data extraction and classification tool to analyze the supply chain social responsibility literature, this paper uses the SOSM to provide a map where the three top approaches are placed side by side in a convenient and easy to grasp visual format. Each approach covers one or more problem contexts along the grid's two dimensions based on their underlying systemic tenets and paradigmatic pertinence. This way, it becomes evident that none of the approaches is creative from a critical systems perspective, and each approach can only address messes in a specific context. Later in the discussion section, further details will be provided about this SOMS-based map.

To help ensure the validity of this paper, specific techniques from content analysis were incorporated into this SLR. Content analysis is a qualitative research method for making scientific, objective, systematic and generalizable inferences from texts.[49] Firstly, the analysis was guided by a data-language—described in detail below—following the four systems thinking paradigms: Functionalism; Interpretivism; Emancipation; and Postmodernism. Secondly, the results were validated by having a calculated reliability data set—from each social responsibility approach's reference guide—recoded by an independent analyst who received proper training and a guiding codebook; the training and guiding book thoroughly explained the four systemic paradigms and the SOSM. Finally, the outcomes of the second coding were used to calculate intercoder reliability coefficients to prove this study's generalizability. The following subsections outline the details of the SLR as recommended by Kitchenham et al.[48]

Cordoba-Pachon and Paucar-Caceres[50] have also used Content Analysis in analyzing a body of literature. They used a software tool called Leximancer to help surface concepts or themes emerging in the literature of information systems. The authors' aim was to understand who Information Systems (IS) knowledge unfolded over time from a social sciences perspective. The authors found that IS concepts such as System and information do not accumulate but instead reappear over time.

Finding primary studies

To find the necessary primary documents, the 10 databases used by Basta et al.[17] were searched again for journal articles, the only difference in this paper is that the period covered is from 2004 to 2017 instead of from 2004 to 2015. The databases were: American Society of Civil Engineering; Compendex; Emerald; Inspec; Proquest; Science Direct; Scopus; Web of Science; Wiley Online Library; and Worldcat. Since this paper is interested in studying a similar dataset to the one used in Basta et al.[17] and to build on the authors work, a similar search string was reused:

("supply chain" AND "social sustainability") OR ("supply chain" AND "social risk") OR ("value chain" AND "social sustainability") OR ("value chain" AND "social risk") OR (Logistics and "social risk") OR (Logistics AND "social sustain-ability").

This string returned a total of 1387 articles, 204 of which were duplicates, which were filtered out, leaving 1183 articles:

Inclusion and exclusion criteria

The SLR method requires the definition of a set of inclusion and exclusion for the primary documents. This study used the following inclusion criteria: the article is about supply chain social responsibility; is published inclusively between 2004 and 2017; is a journal article; is written in the English language; and is available in the Portable Document Format

(PDF). The sole exclusion criterium was that the article is not about philanthropy, charity, or social innovation. Applying the inclusion and exclusion criteria excluded 593 inadequate articles, leaving 590 pertinent ones.

Data language

After the SLR uncovered the top three social responsibility approaches using keyword searches. However, this paper avoided keyword searches in the next step to examine the actual social responsibility references of these approaches. It relied instead on the careful reading of every paragraph in every examined reference. As explained in Basta et al.,[17] keyword searches only generate superficial insights, they overlook context while focusing on counts, which prevents uncovering implicit tenets such as the systemic qualities a reference embraced. Instead, careful reading can uncover such innate systemic qualities, and therefore allows associating a paragraph to specific variables in the data-language, with which one could quickly identify the paradigms used by a document.

To guide the evidence extraction process, a well-defined and reliable analysis scheme must be defined.[51] To build on the work of Basta et al.,[17] the scheme for this paper was designed in the form of a data-language; since in this paper we are also interested in uncovering innate systemic pertinences, the difference is that this paper focuses on the top three social responsibility approaches as a opposed to the entire supply chain literature.

A data language is a descriptive device in the form of a system of categories and their measurements used in classifying and analyzing relevant data which is itself organized into chunks called "coding units." A data-language mediates between unstructured phenomena and the scientific inferences about them. It must be simple, detailed and basic.[49]

Accordingly, the following is the paradigm-based data-language using in this paper, it is similar to the one used by Basta et al.[17] It has four variables each providing a conceptualization of a given systems thinking paradigm. These variables are system complexity, participant backgrounds, consensus possibility, and goal (see Table 1). To be included in a paradigm, a paragraph must contain fragments of text, of any size and not necessarily contiguous, that denote the presence of principles from one or more of the four paradigms.

The variables of the data-language are mutually exclusive, which is guaranteed by the inherent mutual exclusivity of the paradigms. When coding a reference, it was read in its entirety. Every paragraph was analyzed separately to uncover any innate systems thinking principles, in order to associate it with one or more paradigms.

1. Functionalism[22]
   - Definition: the paragraph uses principles like those of the functionalist paradigm.
   - Example: The formed team of practitioners discussed how to assess and measure the social effects, and how to assign a result or a number to the working conditions in factories.
2. Interpretivism[22]
   - Definition: the paragraph uses principles like those of the interpretive paradigm.
   - Example: the team may wish to hold discussions with key external stakeholders about CSR. Mapping the interests and concerns of stakeholders against those of the firm can reveal both opportunities and potential problem areas.
3. Emancipation[22]
   - Definition: the paragraph uses principles like those of the emancipatory paradigm.
   - Example: It can also be useful to reach beyond those with whom the firm has contractual relations to more broadly affected groups, such as consumer, labor and environmental organizations, community groups and governments.
4. Postmodernism[22]
   - Definition: the paragraph uses principles like those of the postmodern paradigm.
   - Example: Eventually, the factory's management decided to upgrade its agronomics monitoring and safety equipment in a staged and priority-driven approach over the next 3 years due to limited resources, this is in spite of what was initially agreed to with the workers. Management felt that was the right solution the financial circumstances. The workers were involved in making this concession and agreed to this modified commitment.

Although in the literature previous works[34] used comparable classification schemes which they based on some systemic paradigms, our classification scheme is different in that it does not rely on a simple keyword-search confined to the title and abstract of an article. Instead, our classification scheme identifies the implicit systemic tenets in all paragraphs of all the references listed above before the latter can be linked to one or more categories each linked a systemic paradigm. Careful reading of every paragraph of every reference looking for codes of optimization, inclusiveness, Emancipation, and fairness was necessary.

Data extraction

To find the most adopted social responsibility approaches, all journal articles remaining from collection step were searched for keywords denoting them, then the top three approaches were selected for further analyses. The following is the set of keywords used.

Table 2. SOSM grid and its ideal-types.

		Participants		
		Unitary	Pluralist	Coercive
Systems	Simple	Simple- Unitary	Simple- Pluralist	Simple- Coercive
	Complex	Complex- Unitary	Complex- Pluralist	Complex- Coercive

Legend: Functionalism; Interpretivism; Emancipatory; Postmodernism

CSR (including name variations), SLCA (including name variations), ESG (including name variations), Sustainable Design (e.g., Quality Function Deployment for the Environment), Industry Standards (e.g., SA8000), Sustainable Reporting (e.g., GRI).

To aid in the analysis and visualization of the data, the SOSM was used. SOSM can be used to analyze and reveal the assumptions and paradigms of any management technique, from any discipline, from a creative systems thinking perspective.[22] The SOSM assumes that the difficulty in managing problem-contexts stems from their increasing complexity, change, and diversity which in turn originate from two sources: the system being dealt with, in terms of its size and structure; and the compatibility of the views and interests of the systems' participants. Accordingly, the SOSM is based on a grid with two dimensions: the system's complexity, and compatibility of its participants. Each cell represents one of the aforementioned reality-types, making the visualization and analysis using the four paradigms much more intuitive and informative. The SOSM relates each social responsibility approach to the reality-types it can address and therefore determining the approaches' paradigms, see Table 2. The vertical axis presents a continuum of system types ranging from simple to extremely complex, whereas the horizontal axis presents the types of relationships between the systems' participants, which could be either "unitary", "pluralist", or "coercive."

Using the SOSM allows for a direct and theoretically founded comparison of the top social responsibility approaches, which previously has only been done superficially through surveys and structured interviews.[13] This paper offers a scientific understanding, while explaining the mixed and sometimes contradictory results on the performance of the various approaches.

Quality assessment

To establish internal and external validity, SLRs demand high quality of both the evidence extraction process and its results.[48] This is done by having more analysts recode a sample of coding-units from the original population, which is called a reliability data set. The coding-units for this review were the individual paragraphs in each reference guide.

The size of the reliability data set—the subset of paragraphs that need to be recoded from the total population of 1883 paragraphs—was calculated as per the content analysis methodology.[49] It is worth noting that P_k is the ratio of the total number of paragraphs belonging to the least present paradigm in an examined reference, α_{min} is the smallest alpha for coding to be considered as reliable, whereas p is the statistical significance. The calculations are shown in Table 3.

Subsequently, reliability data sets for each of the articles were sent to an independent analyst. The analyst was provided with a codebook, given training and was left to code independently. The results were used to calculate the inter-coder agreement coefficient KALPHA using Microsoft R. The results are shown in Table 4. Note that N/A denotes Not Applicable.

Results and discussion

The analyses highlighted valuable insights into the most adopted social responsibility approaches and their systems thinking tenets. This discussion is organized into subsections following this papers' research questions listed earlier.

Figure 1 next highlights the differences between this paper and Basta et al.[17]

Table 3. Number Nk\not-k = T (Pk, αmin, p) of values for αmin to inform reliability.

	Population	Functionalism (%)	Interpretivism (%)	Emancipation (%)	P_k	α_{min}	p	Sample
CSR	572	17	68	15	0.167	0.800	0.050	189
SLCA	472	77	13	10	0.100	0.800	0.050	293
SA8000	839	15	14	71	0.143	0.800	0.050	214

Table 4. Intercoder KALPHA agreement coefficients.

	Functionalism	Interpretivism	Emancipation	Postmodernism
CSR	0.849	0.814	0.824	N/A
SLCA	0.904	0.931	0.971	N/A
SA8000	0.935	0.861	0.822	N/A

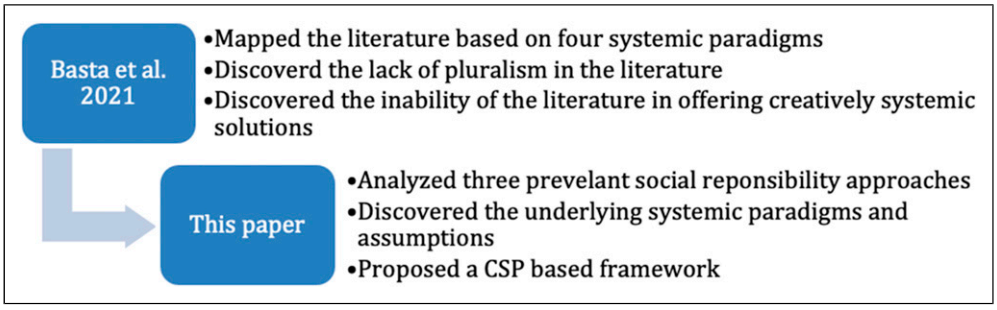

Figure 1. How this paper differs from Basta et al.[17]

RQ1. What are the top three supply chain social responsibility approaches?

It was found that CSR[52] was used in 41.81% of the articles that employed industry approaches, whereas SA8000 was used in 15.97% of the articles. Moreover, SLCA[53] and sustainable reporting, such as the Global Reporting Initiative (GRI), each occupied roughly 15%. Consequently, the official references for CSR, SA8000,[54] and SLCA were acquired for further analysis. GRI was excluded due to time and resource constraints.

RQ2. To what extent is CSR underpinned by systems thinking perspectives?

Analyzing the CSR reference revealed that most of its paragraphs identified various principles, practices, and instructions associating the approach with the interpretive paradigm. This was especially clear given its emphasis on addressing stakeholder subjectivity and on the idea that stakeholder inclusiveness and engagement are prerequisites to success. Moreover, many of the paragraphs indicated that CSR is suitable for all business sizes, be it a single small firm or an entire supply chain. See Figure 2.

Interestingly, a few paragraphs from the CSR reference uncovered hints of emancipation, where all stakeholders affected by the activities of a supply chain take part in the decision-making process, e.g., "it can also be useful to reach beyond those with whom the firm has contractual relations." Nevertheless, such evidence was in the form of recommendations, not requirements, and revolved around stakeholder consultation rather than including them in decision making. Moreover, the reference allows senior management to choose which stakeholders are within their supply chain's sphere of influence.

Additionally, a few paragraphs underscored some CSR practices that follow predefined and process-like procedures, e.g., conducting initial assessments. Such practices require the participation of senior management or the board of directors who are initiating-stakeholders with political power, therefore hinting at a very limited functionalist nature of CSR. Finally, no paragraphs were found connecting CSR to postmodernism.

RQ3. To what extent is SLCA underpinned by systems thinking perspectives?

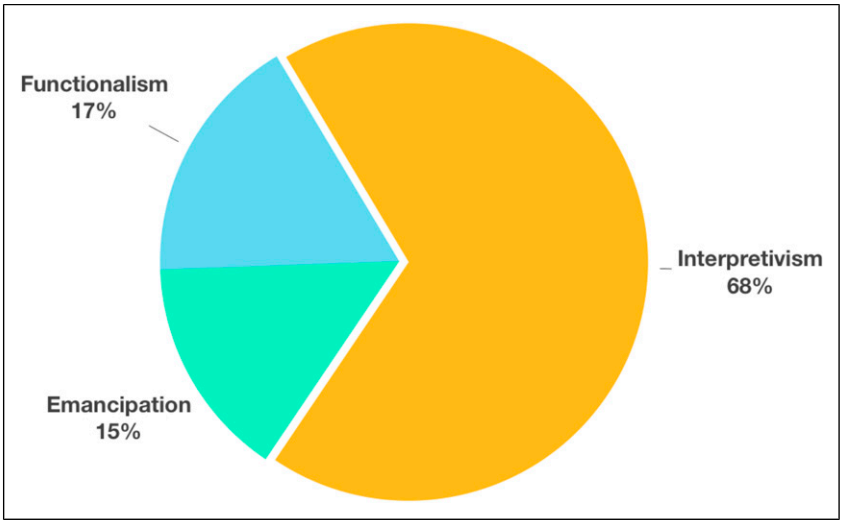

Figure 2. Corporate social responsibility paradigm usage.

Inspecting the coding results of the SLCA reference showed that the approach is primarily functionalist, except for a few paragraphs recommending, but not stipulating, the participation of certain stakeholder groups, e.g., "engage [impacted people or their communities] as much as possible," thus relating the approach to interpretivism. Similarly, a few other paragraphs recommended, but did not necessitate, the involvement of the disadvantaged stakeholders in decision making, hence adding an emancipatory aspect to the approach. Furthermore, the SLCA reference made it very clear that the approach is intended only for supply chains and is not particularly useful when implemented by a single firm, given the limited data it can collect about its impacts in such cases. No paragraphs were found connecting SLCA to postmodernism. See Figure 3.

RQ4. To what extent is SA8000 underpinned by systems thinking perspectives?

Examining the coding results of the SA8000 reference revealed that the approach is uniquely emancipatory, apart from a few paragraphs suggesting very limited interpretive and functionalist traits, such as giving the audited organization's management the freedom to establish a complaints management system of their choosing, without involving the impacted stakeholders.

The chief goal of SA8000 is to get all stakeholders affected by the organization to become part of its decision-making process. This approach includes a wider range of stakeholders such as communities, workers, worker-families and even schoolteachers. The approach is designed to be used by single organizations with the possibility of collaboration with immediate suppliers. The approach also recommends but does not require collaboration with lower-tier firms in its supply chain. No paragraphs were found connecting SA8000 to postmodernism. See Figure 4.

RQ5. Are the top three supply chain social responsibility approaches founded on multiple systemic paradigms?

The results revealed varying degrees of association between the top three supply chain social responsibility approaches and the four systemic paradigms. For instance, CSR showed evidence of Strong Association (SA) with interpretivism, Week Association (WA) with emancipation, Very Week (VWA) association with functionalism, and No Association (NA) with postmodernism. Table 5 provides an overview of the associations between the three approaches and the paradigms. In summary, SLCA focuses on improving goal seeking and viability by solving well-defined problems identified by the powerful stakeholders. CSR explores purpose while addressing the subjectivity of stakeholders, whereas SA8000 ensures fairness by acknowledging all impacted stakeholders.

It is worth noting that the degrees of association denote how the principles from a certain paradigm are present in an approach as shown in the previous figures, and whether they take the form of requirements or suggestions.

The results also highlighted an interesting finding in that none of the approaches were associated with postmodernism. All three approaches followed a particular school of thought and a process-driven way for tackling social responsibility. Moreover, all three approaches promised improvements when implemented; such ideas are rejected by postmodernism, which is essentially opposed to the premise of systemic solutions and instead

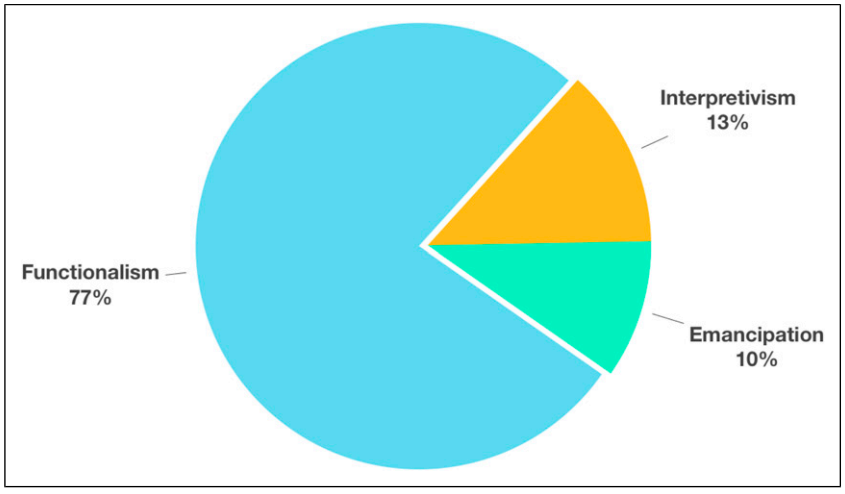

Figure 3. Social life cycle assessment paradigm usage.

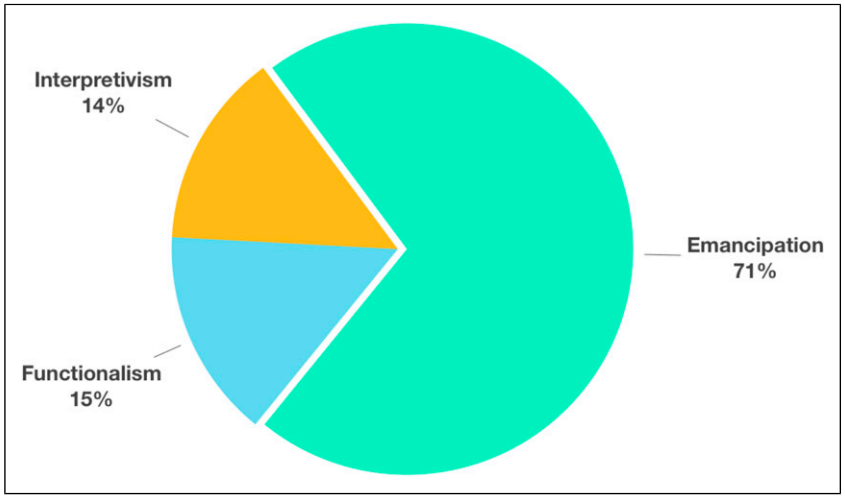

Figure 4. Social accountability 8000 paradigm usage.

Table 5. Approach paradigm association.

	Functionalism	Interpretivism	Emancipation	Postmodernism
CSR	VWA	SA	WA	NA
SLCA	SA	VWA	VWA	NA
SA8000	VWA	VWA	SA	NA

Table 6. Approach assumptions.

	Business entity complexity	Stakeholder views
CSR	Single firm, supply chain	Pluralist
SLCA	Supply chain	Unitary
SA8000	Single firm	Coercive

promotes diversity, creativity, as well as contested and localized solutions that are justified on the basis that they "feel" right.[22]

Perhaps one of the most important findings from this paper is that each approach predominantly relates to a single paradigm, despite none of them making its systems thinking underpinnings clear. The findings revealed that all three are

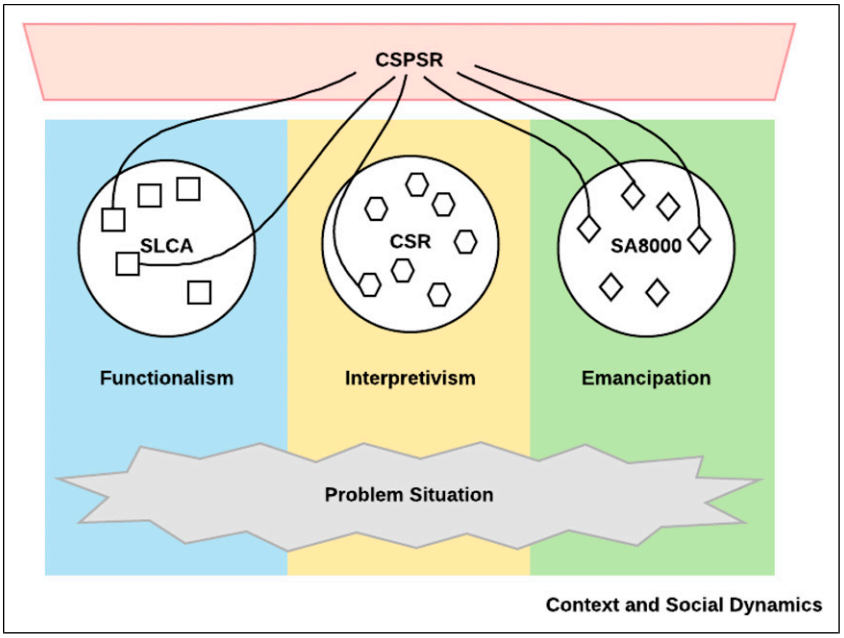

Figure 5. Proposed framework for supply chain social responsibility.

in fact systemic approaches. Moreover, their assumptions can be summarized in relation to two dimensions: the complexity of the business entity they address, and the views of the stakeholders they acknowledge, as shown in Table 6. However, none of the approaches is holistically multi-perspective because each is dominated by one paradigm, and each does different things to solve the factors of the messes it perceives. See Figure 5.

RQ6. Are the top three supply chain social responsibility approaches capable of addressing all factors of a social responsibility mess from a systems thinking perspective?

The finding that each of the top three supply chain social responsibility approaches pertains to a different systemic paradigm is significant: it shows that none of them takes a creative and holistic view of the messes of interest, therefore making different assumptions about them, and considers some factors more significant than others. This finding uncovers that each of these approaches defines the problem differently, given what their corresponding paradigm allows, and hence offers divergent and partial solutions. Therefore, there is no one-size-fits-all approach, but rather different approaches specialize and do well in addressing different parts of a social responsibility mess. To further frame the findings from a systems thinking perspective, Table 7 shows where the three approaches are located on the SOSM grid based on their systemic assumption along the grids' two dimensions.

The table can be used as a map, called the SOSM Approaches Map (SAM), to determine the suitability of an approach given the context of a social responsibility mess. SAM makes it clear why a supply chain adopting only one of these approaches is almost guaranteed to continue to endure social responsibility messes. SAM shows how a certain approach reduces the messes of social responsibility into its systemic paradigm assumptions and worldview.

RQ7. Can the top three supply chain social responsibility approaches be used in tandem in a CSP-like intervention?

The finding that each of these top three approaches is confined within a different systemic paradigm could be discouraging. However, from a Critical System Practice (CSP) standpoint, the opposite is true. CSP advocates for holistic and creative interventions by deducing solutions that better account for the context (reality-types) of a social responsibility mess. CSP emphasizes that messes cannot be understood and addressed from one paradigmatic perspective, and as such promotes the combination of a plurality of systems approaches. It seeks to guarantee pluralism in perspective by compensating for the systemic weaknesses of one approach by the strengths of others. By doing so, CSP ensures that factors concerning technical-optimality (Functionalism), practical-subjectivity (interpretivism) and political-fairness (emancipation) are addressed.

With CSP viewing the different approaches as complementary, it is poised to offer interventions that address all factors of supply chain social responsibility messes, as

Table 7. The SOSM approaches map.

	Participants			
		Unitary	Pluralist	Coercive
Systems	Simple		CSR	SA8000
	Complex	SLCA		

Legend:
Functionalism Interpretivism Emancipatory

opposed to any of the paradigm-confined approaches. CSP sees the bigger picture when dealing with complex systems such as the supply chain and their complex social context. CSP allows for a plurality of approaches to be used in a coherent and complementary manner to promote successful interventions where there are complex organizational and societal problem situations.

From a practical view and considering the findings from this paper, SLCA is a functionalist approach, it excels at solving the well-defined social impact assessment factors of the messes of supply chain social responsibility, it answers the questions of those with the organizational power and resources who initiated it. However, it fails quickly when different stakeholders with different views, aims, and backgrounds are involved, in such situations is where CSR shines. With great ease, CSR is capable of bringing stakeholders with different viewpoints together to agree on small plans of action, or accommodations, that move the cause forward and enable progress. Nevertheless, CSR, being dominantly interpretive in nature, falls short in face of conflict or when the unaccounted-for stakeholders are wary, specifically those who are affected by the supply chains' activities but do not participate in decision making. Such situations require approaches of an emancipatory nature such as SA8000 capable of giving the disadvantage stakeholders a say in decision making.

Conclusion

Supply chains are increasingly incorporating social responsibility into their business strategies. This trend is being reinforced by the direct impact of incidents like protests, consumer boycotts and negative media coverage on their bottom lines. Such incidents result from absent or ineffective social responsibility practices, which in turn cause serious issues such as worker abuse, factory collapses, and natural resource depletion.

Consequently, a myriad of approaches and techniques have emerged promising solutions. The goal of this paper is to understand why they consistently fall short from addressing supply chain social responsibility messes. This paper analyzed three of the top used amongst them to understand to what extent these approaches are underpinned by systems thinking perspectives to uncover their systemic strengths and shortcomings. The approaches that were analyzed were CSR, SLCA, and SA8000.

The analyses revealed that each approach is confined within one systems thinking paradigm. Therefore, each approach has different worldviews, considers different factors as significant, and consequently offers divergent partial solutions. Different approaches address the messes of interest as either optimization issues, by addressing subjectivity, or by resolving conflicts. In systems thinking terms, each approach makes different assumptions about the context of the messes of interest.

Accordingly, this paper presents novel findings as far as these three selected approaches are concerned, and to our knowledge, from reviewing the literature, no such systemic grounding was done before. This paper shows that SLCA is concerned with improving goal seeking and viability by solving well defined problems identified by the powerful amongst the stakeholders. On the other hand, CSR is concerned with exploring purpose while addressing the subjectivity of stakeholders, whereas SA8000 is concerned with ensuring fairness.

Nevertheless, the findings are promising from a CSP standpoint. Advocating that approaches from different paradigms are complementary rather than contradictory, CSP is in a position to offer superior multi-paradigm interventions by incorporating the tools and techniques from CSR, SLCA and SA8000, thereby constructing a complete view of a social responsibility mess. Therefore, researchers and practitioners alike can deduce holistic and creative CSP interventions based on these three approaches, with the advantage of not having to learn the various systems

thinking paradigms and their associated methodologies. This understanding is developed into framework presented in the next subsection.

In terms of practical implications, this paper provides a scientific exploration of the top three social responsibility approaches from a systems thinking perspective, something that is so far done superficially via interviews and surveys, therefore filling an important knowledge gap.

Moreover, this paper sheds light on an overlooked yet important factor concerning the limitations of the most common social responsibility approaches. After having established the systemic paradigms of each, it is straightforward to determine the suitability of an approach given a social responsibility mess from a managerial perspective for instance. This is further simplified using the SAM framework presented earlier.

Finally, this paper showed that new forms of better interventions are possible. These interventions can perceive all factors of a supply chain social responsibility mess, therefore tailoring customized solutions based on the tools and methods from the very well understood existing approaches, making such interventions highly convenient and practical.

In terms of limitations, the allocated resources allowed us to focus only on the top three social responsibility approaches. In future work, the authors intend to study more approaches such as Environmental Social and Governance, the Global Reporting Initiative, etc.

For future research, it is worth investigating more mainstream approaches such as the GRI, ISO26000, ESG, and others. Moreover, an intriguing research project would be to conduct an action research based on the findings from this paper where a volunteering firm, that is interested in preventing or is facing social responsibility messes, is guided into implementing an intervention using CSP for Social Responsibility (CSPSR) which will be presented in the next section.

Therefore, we propose an idea of a framework that could worked on in future research for addressing the messes of supply chain social responsibility. Note that this is only a preliminary version. Further ameliorations and details will be presented in a forthcoming paper with insights from this paper and Basta et al.[17] A possible path is to conduct a case study where this proposed framework will be used to design and implement preventive and reactive social responsibility interventions based on Critical Systems Thinking. One expectation would be to help the participants appreciate the differences between the social responsibility approaches they already know, and how to choose amongst them given the messes they are facing.

The framework is an application of Jackson's Critical System Practices metamethodology, which promotes the combination of a plurality of systems approaches, their methodologies, and methods in solving messes. The framework is called CSPSR and is a proposal that remains to be tested. In this framework, each approach is broken into its composing techniques, then interventions are tailored by reassembling carefully selected techniques from different approaches according to the nature of the mess being addressed. Therefore, the interventions tailored by CSPSR are cross-paradigm, which is guaranteed given its incorporation of techniques from the various approaches. Researchers and practitioners alike, who are not familiar with systems thinking, can leverage this framework to devise critical and holistic interventions in an informed and scientific way.

For example, a CSPSR-based supply chain social responsibility intervention may utilize CSR tools to bring together stakeholders with different worldviews to formulate objectives, develop a strategy and agree on commitments. Moreover, stakeholder definition and interviewing techniques from SA8000 can be used to ensure that all impacted stakeholders such as surrounding communities participate in the. Additionally, SLCA could be used to get an objective account, based on data collection, of what the current social footprint is, as well as providing reports that give an idea of what initiatives are possible and where resources should be allocated.

Figure 5 depicts the proposed framework. Each circle represents one of the analyzed approaches. The small distinct shapes within each circle represent the tools of the corresponding approach. The figure also highlights how each approach is confined within a different paradigm, hence highlighting their limitations, and how this setting can allow them to only offer partial solutions to the factors of a mess they perceive and consider significant. More importantly, the figure shows how the proposed framework functions across the paradigms by using various tools from the different approaches while also considering the social context. This way, the framework can perceive all facets of a mess and tailor interventions that are far better than what the other approaches can singly offer. Jackson[22] explained CSP and how it can be used to consolidate approaches from different systemic paradigms and how to use them to resolve systemic mess.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iDs

Mohamed Basta https://orcid.org/0000-0002-2216-1038
James Lapalme https://orcid.org/0000-0002-7142-7859

Supplemental Material

Supplemental material for this article is available online.

References

1. Zenko Z and Sardi V. Systemic thinking for socially responsible innovations in social tourism for people with disabilities. *Kybernetes* 2014; 43: 652–666.
2. Štrukelj T and Šuligoj M. Holism and social responsibility for tourism enterprise governance. *Kybernetes* 2014; 43: 394–412.
3. Moratis L and Cochius T. *ISO 26000: the business guide to the new standard on social responsibility*. New York, NY: Routledge, 2017.
4. Feng Y, Zhu Q and Lai KH. Corporate social responsibility for supply chain management: a literature review and bibliometric analysis. *J Clean Prod* 2017; 158: 296–307.
5. Ackoff RL. The art and science of mess management. *Interfaces* 198b; 11(1): 20–26.
6. Walker H, Seuring S, Sarkis J, et al. Sustainable operations management: recent trends and future directions. *Int J Oper Prod Manag* 2014; 34.
7. Dyck R. Youth education for social responsibility. *Syst Res Behav Sci* 2015; 32(2): 168–174.
8. Dankova P, Valeva M and Štrukelj T. A comparative analysis of international corporate social responsibility standards as enterprise policy/governance innovation guidelines. *Syst Res Behav Sci* 2015; 32(2): 152–159.
9. Boardman J and Sauser B. *Systemic thinking: building maps for worlds of systems*. Hoboken, NJ: John Wiley & Sons, 2013.
10. Dzombak R, Mehta C, Mehta K, et al. The relevance of systems thinking in the quest for multifinal social enterprises. *Syst Pract Action Res* 201427(6): 593–606.
11. Popovic T and Kraslawski A. Social sustainability of complex systems. *InComputer aided chemical engineering* 2015; 36: 605–614. Elsevier
12. Pullman M. *Sustainability delivered: designing socially and environmentally responsible supply chains*. New York, NY: Business Expert Press, 2012.
13. Chiarini A and Vagnoni E. Differences in implementing corporate social responsibility through SA8000 and ISO 26000 standards: research from European manufacturing. *J Manuf Technol Manag* 2017; 28: 438–457.
14. Williams A, Kennedy S, Philipp F, et al. Systems thinking: a review of sustainability management research. *J Clean Prod* 2017; 148: 866–881.
15. Doloi H. Assessing stakeholders' influence on social performance of infrastructure projects. *Facilities* 2012; 30: 531–550.
16. Hester PT and MacG K. *Systemic decision making*. Cham, Switzerland: Springer International Publishing AG, 2017.
17. Basta M, Lapalme J and Paquet M. A systems thinking analysis of the supply chain social responsibility literature. *Syst Res Behav Sci* 2021; 38(4): 537–554.
18. Yu Y and Choi Y. Stakeholder pressure and CSR adoption: the mediating role of organizational culture for Chinese companies. *Soc Sci J* 2016; 53(2): 226–234.
19. Veldhuizen LJ, Berentsen PB, Bokkers EA, et al. A method to assess social sustainability of capture fisheries: an application to a Norwegian trawler. *Environ Impact Assess Rev* 2015; 53: 31–39.
20. Hofmann H, Busse C, Bode C, et al. Sustainability-related supply chain risks: conceptualization and management. *Bus Strat Environ* 2014; 23(3): 160–172.
21. Basta M, Lapalme J, Paquet M, et al. How are supply chains addressing their social responsibility dilemmas? Review of the last decade and a half. *Corp Soc Responsib Environ Manag* 2018; 25(5): 833–843.
22. Jackson MC. *Systems thinking: creative holism for managers*. West Sussex, England: John Wiley & Sons, Inc., 2003.
23. Flood RL and Romm NR. Enhancing the process of methodology choice in total systems intervention (TSI) and improving chances of tackling coercion. *Syst Pract* 1995; 8(4): 377–408.
24. Mingers J and Brocklesby J. Multimethodology: towards a framework for mixing methodologies. *Omega* 1997; 25(5): 489–509.
25. Midgley G. Dealing with coercion: critical systems heuristics and beyond. *Syst Pract* 1997; 10(1): 37–57.
26. Molderez I and Ceulemans K. The power of art to foster systems thinking, one of the key competencies of education for sustainable development. *J Clean Prod* 2018; 186: 758–770.
27. Waller MA, Fawcett SE and Johnson JL. The luxury paradox: how systems thinking and supply chain collaboration can bring sustainability into mainstream practice. *J Bus Logist* 2015; 36(4): 303–305.
28. Kopanaki E, Stroumpoulis A and Oikonomou M. The impact of blockchain technology on food waste management in the hospitality industry. *Entrenova* 2021; 7(1): 428–437.
29. Knežević B, Škrobot P and Žmuk B. Position and role of social supermarkets in food supply chains. *Bus Syst Res: International journal of the Society for Advancing Innovation and Research in Economy* 2021; 12(1): 179–196.
30. Córdoba JR and Campbell T. Systems thinking and corporate social responsibility. *Syst Res Behav Sci* 2008; 25(3): 359–360.
31. Kuhn TS. *The structure of scientific revolutions*. 4th ed. Chicago, IL: University of Chicago press, 2012.
32. Wallis SE. The science of conceptual systems: a progress report. *Found Sci* 2016; 21(4): 579–602.
33. Jackson MC and Keys P. Towards a system of systems methodologies. *J Oper Res Soc* 1984; 35(6): 473–486.
34. Paucar-Caceres A and Wright G. Contemporary discourses in information systems research: methodological inclusiveness in a sample of information systems journals. *Int J Inf Manag* 2011; 31(6): 593–598.
35. Kytle B and Ruggie JG. Corporate social responsibility as risk management: a model for multinationals.

36. Das K and Rao Posinasetti N. Addressing environmental concerns in closed loop supply chain design and planning. *Int J Prod Econ* 2015; 163: 34–47.
37. Fang Y and Shou B. Managing supply uncertainty under supply chain Cournot competition. *Eur J Oper Res* 2015; 243(1): 156–176.
38. Serdarasan S and Tanyas M. Dealing with complexity in the supply chain: the effect of supply chain management initiatives. *SSRN* 2012; 2012(1). Available at SSRN 2056331.
39. Solér C, Bergström K and Shanahan H. Green supply chains and the missing link between environmental information and practice. *Bus Strat Environ* 2010; 19(1): 14–25.
40. Sheffi Y and Rice JB Jr. A supply chain view of the resilient enterprise. *MIT Sloan Manag Rev* 2005; 47(1): 41.
41. Starik M and Kanashiro P. Toward a theory of sustainability management: uncovering and integrating the nearly obvious. *Organ Environ* 2013; 26(1): 7–30.
42. Cooper MC, Lambert DM and Pagh JD. Supply chain management: more than a new name for logistics. *Int J Logist Manag* 1997; 8(1): 1–14.
43. Beamon BM. Measuring supply chain performance. *Int J Oper Prod Manag* 1999; 19(3): 275–292.
44. Mentzer JT, DeWitt W, Keebler JS, et al. Defining supply chain management. *J Bus Logist* 2001; 22(2): 1–25.
45. Kortelainen K. Global supply chains and social requirements: case studies of labour condition auditing in the People's Republic of China. *Bus Strat Environ* 2008; 17(7): 431–443.
46. Searcy C. Measuring enterprise sustainability. *Bus Strat Environ* 2016; 25(2): 120–133.
47. Adams KM and Hester PT. Errors in systems approaches. *Int J Syst Syst Eng* 2012; 3(3-4): 233–242.
48. Kitchenham BA, Budgen D and Pearl Brereton O. Using mapping studies as the basis for further research–a participant-observer case study. *Inf Software Technol* 2011; 53(6): 638–651.
49. Krippendorff K. *Content analysis: an introduction to its methodology*. Thousand Oaks, CA: Sage publications, 2018.
50. Córdoba-Pachón JR and Paucar-Caceres A. The unfolding and resurfacing of information systems knowledge over the last 25 years: a systemic perspective. *Syst Res Behav Sci* 2019; 36(4): 445–460.
51. Budgen D, Turner M, Brereton P, et al. Using Mapping Studies in Software Engineering. *InPpig* 2008; 8: 195–204.
52. Hohnen P. Corporate social responsibility. Canada: Canadian Electronic Library. Retrieved from https://canadacommons.ca/artifacts/1211247/corporate-social-responsibility/1764357/on17May2023.CID:20.500.12592/1vxb6z
53. Andrews ES. *Guidelines for social life cycle assessment of products: social and socio-economic LCA guidelines complementing environmental LCA and Life Cycle Costing, contributing to the full assessment of goods and services within the context of sustainable development*. Druk in de weer, Belgium: UNEP/Earthprint, 2009.
54. *Guidance document for social accountability* (SA8000®: 2014). Retrieved from https://sa-intl.org