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Review of Frameworks for Sustainability Implementation

Abdoulmohammad Gholamzadeh Chofreh* and Feybi Ariani Goni
Young Researchers and Elite Club, Ahvaz Branch, Islamic Azad University, Ahvaz, Iran

ABSTRACT

Sustainability enables the creation of new opportunity through innovation to achieve competitive advantage and drive cost reduction programs. Organizations that acknowledge and embrace the key drivers for sustainability will obtain the ultimate benefits of market opportunities and efficient business operations. Numerous organizations are involved in sustainability initiatives and they need a holistic vision to achieve sustainability. This requires a comprehensive framework that shows the perspective of sustainability. This study aims to review the existing sustainability frameworks and highlight the gaps and inconsistencies in the related literature. The literature revealed that there are two important paradigms that need to be considered in sustainability implementation frameworks. They are the sustainability paradigm (environment, social, and economic) and the decisional paradigm (strategic, tactical, and operational). The sustainability and decisional paradigms show the main perspective of sustainability implementation. The integration of these two paradigms is significant for a successful sustainability implementation project. Copyright © 2017 John Wiley & Sons, Ltd and ERP Environment

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Introduction

The concept of sustainability permeates the agendas of governments and public communities (Chofreh et al., 2016). Organizations also have recognized the need to embed sustainability into their business practices (Welford, 2013). This concept has been integrated into various disciplines (Goni *et al.*, 2015) and research on sustainability issues is still growing continually (Lam et al., 2014). Although there were several previous backgrounds, the sustainability initiatives had their formal inception in the 1980s with a number of important policy documents: primarily the World Conversation Strategy (International Union for Conservation of Nature, IUCN, 1980) and the Brundtland Report (Brundtland, 1987) issuing new policy. With the publication of the National Research Council's *Our Common Journey* report came the advent of a novel scientific discipline capable of responding to the challenges and opportunities of sustainable development (Bettencourt and Kaur, 2011).

*Correspondence to: Abdoulmohammad Gholamzadeh Chofreh, Young Researchers and Elite Club, Ahvaz Branch, Islamic Azad University, Ahvaz, Iran.
E-mail: mohammad_apmie@yahoo.com

The World Commission on Environment and Development of the United Nations defined sustainability development as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (Brundtland, 1987). Sustainability academics often designate this commission as a main junction of the integration of sustainability concept into various disciplines (Chofreh *et al.*, 2015). However, the definition of sustainability that had been proposed by the Brundtland Commission is still vague (Christen and Schmidt, 2012), and complex to understand (Goni *et al.*, 2013). Elkington (1994, 2004) argued that the definition of sustainability is related to three dimensions: environmental, economic, and social. This view is typically referred to as the triple bottom line (TBL). The TBL approach implies that, besides economic performance, organizations require to perform actions that positively impact the environment and society (Dao *et al.*, 2011). In fact, it is argued that a company's long-term profitability and survival are best served by balancing it with social and environmental objectives (Porter and Kramer, 2006).

Various organizations are involved in sustainability initiatives in their corporate strategy (Chofreh *et al.*, 2015). They understand that they have a responsibility to participate in solving important environmental problems and their consumers expect them to provide sustainable products and services (Chofreh *et al.*, 2014). Sustainability needs sustainable business practices. In doing so, the organizations need a comprehensive framework that shows the perspective of sustainability (Chofreh, 2015). This study reviews the existing sustainability frameworks and underlines the research gaps and inconsistencies in the literature for future improvement of sustainability frameworks. The following section presents the review of the existing sustainability implementation frameworks. The third section describes the decision-making levels in an organization. The fourth section discusses the research gaps and inconsistencies in the literature. The fifth section concludes the study with a contribution and suggestion for future studies.

Sustainability Frameworks

Kobryn (2000) defined a framework as a design model that manages a complex topic in conceptual structure, provides methodology for application development, and delineates relationships between the components. In order to support the decision making during the sustainability implementation, the decision makers need to have a sustainability framework. This framework helps the practitioners to harmonize decision-making practices regarding sustainability development (Heemskerk *et al.*, 2002). It should assist the standard setters and regulators to develop guidelines and assist the decision makers to deal with the application implementation where no detailed guidelines exist.

A framework should be general and tackle the common information needs of a broad range of users. According to Heemskerk *et al.* (2002), a framework should ideally address four elements. The first element is the underlying notion of sustainability and how it is applied in organizational circumstances. This helps to set the background and should be based on the needs of decision makers. The second element is the objectives of the project. The third element is the qualitative features that determine the usefulness of the information contained in the framework. The fourth element is a framework that should define the fundamental elements of a system.

There are numerous studies that have proposed a framework for the implementation of sustainability. Table 1 is given to summarize these frameworks in order to highlight the research gaps and inconsistencies in the literature for future improvement of sustainability frameworks.

According to the table, it can be concluded that there are various dimensions identified in the sustainability frameworks. These dimensions generally considered two main paradigms: the sustainability paradigm and the decisional paradigm. From the sustainability paradigm, several dimensions pertinent to sustainability implementation were identified. According to Elkington (1994), the first dimension is environment, which refers to sustainable environmental practice. The second dimension is social, which pertains to fair and beneficial business practices toward labor and the community and region in which an organization conducts its business. The third dimension is economic, which refers to the economic value created by the organization.

From the decisional paradigm, numerous dimensions pertinent to decision making in system implementation were identified. The first dimension is the strategic level, which pertains to activities and tasks of top management

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Author (year)	Research focus	Dimension	Method
Heemskerk *et al.* (2002)	sustainability reporting	*Management process* 1. Objectives 2. Planning 3. Activities 4. Follow-up/appraisal 5. Review/learning *Reporting process* 1. Objectives 2. Planning 3. Constructing the report 4. Distributing the report 5. Collecting/analyzing feedback	survey and case study
British Standards Institution (BSI) (2003)	sustainability transformation	1. Leadership and vision 2. Planning 3. Delivery 4. Monitor, review, and report	conceptual research and case study
Burke and Gaughran (2007)	sustainability engineering and manufacturing SMEs	1. Environmental awareness program 2. Initial environmental review 3. Strategy development 4. Environmental policy 5. Environmental aspects and legislation 6. Objectives, targets, and programmers 7. Implementation and operation 8. Monitoring, auditing, and reviewing	case study
Glavič and Lukman (2007)	sustainability terminology	1. Triple bottom line (environment, economy, and society) 2. Sustainability policy, systems, sub-systems (strategies), approaches (tactics), and principles	conceptual research
Loorbach *et al.* (2009)	sustainability transformation	*Transition management levels* 1. Strategic 2. Tactical 3. Operational	conceptual research and case study
Ahmed and Sundaram (2012)	sustainability reporting	1. Discover and learn 2. Strategies 3. Design 4. Transform 5. Monitor and control	conceptual research and peer review
International Integrated Reporting Council (IIRC) (2013)	sustainability decision making	1. Organizational overview and external environment 2. Governance 3. Business model 4. Risks and opportunities 5. Strategy and resource allocation 6. Performance	

(Continues)

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Author (year)	Research focus	Dimension	Method
		7. Outlook	
	conceptual research	8. Basis of presentation	
Hahn *et al.* (2015)	corporate sustainability implementation	1. Analyze	conceptual research
		2. Design	
		3. Implement	
		4. Monitor and control	
Laurenti *et al.* (2016)	global sustainability implementation	1. Plan: defining, forecasting, organizing	conceptual research
		2. Do: demanding, executing	
		3. Check: controlling, coordinating	
		4. Act: standardizing, correcting	
Panagiotakopoulos *et al.* (2016)	sustainability management	1. Operations	conceptual research
		2. Management	
		3. Environment	
Gallotta *et al.* (2016)	corporate sustainability implementation	1. Sustainability dimensions	conceptual research
		2. Systemic	
		3. Organizational	
		4. Individual	

Table 1. Review of research in framework for sustainability implementation

(Montana and Charnov, 2008). The second dimension is the tactical level, which refers to activities and tasks of midlevel management (Montana and Charnov, 2008). The third dimension is the operational level, which refers to activities and tasks of the supervisory level (Montana and Charnov, 2008).

Heemskerk *et al.* (2002) developed a sustainability reporting framework in order to assist companies in generating sustainability reporting. The framework consists of two main processes: management and reporting. The British Standards Institution (British Standards Institution, BSI, 2003) designed the SIGMA framework, which provides guidance for companies to implement sustainability. It provides a comprehensive set of practitioner tools and techniques available to help companies manage the trade-offs associated with the environment, social, and economic aspects. In addition, the framework includes highly effective ways of engaging with different stakeholders.

In another study, Burke and Gaughran (2007) proposed a framework for sustainability implementation in small and medium enterprises (SMEs) in engineering and manufacturing. They stated that transformation of SMEs towards achieving sustainability is important; however, they are not equipped with the appropriate knowledge and tools to manage this. They still have difficulty in transforming their operations towards sustainability. In their study, the authors developed a sustainability implementation framework for SMEs by using ISO 14001 and the sustainability triple bottom line as a foundation.

To overcome the confusion of various terms in the sustainability field, Glavič and Lukman (2007) developed a hierarchical classification of sustainability terms and their relationships. In their study, the authors clarified the meanings and applications of 51 terms in sustainability and their definitions. To develop their framework, they used a systems approach, which consists of environment, economy, and society principles.

Loorbach *et al.* (2009) proposed a transition management framework towards sustainable business. They used transition management theory to accelerate the process of sustainability transformation. In addition, Ahmed and Sundaram (2012) developed a sustainable business transformation framework for integrated sustainability modeling and reporting. As a proof of concept, they evaluated the framework through peer review methods.

The International Integrated Reporting Council (International Integrated Reporting Council, IIRC, 2013) developed a framework to provide a foundation for the implementation of integrated sustainability reporting. This framework provides principle-based guidance for companies and other organizations to prepare an integrated report,

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accelerate individual initiatives, and provide impetus to greater innovation in corporate reporting. Laurenti *et al.* (2016) proposed a global sustainability planning framework that relates material flows and socio-economic drivers. The approaches used in the framework include end-of-pipe solutions, cleaner production, eco-design, and system integration.

There are numerous methodologies employed in the area of sustainability implementation frameworks, including conceptual research, survey, case study, peer review, or combinations of the above. Morse and Richards (2012) stated that the choice of methodology depends on the stage of the research and the nature of the problem to be addressed. No method can be considered superior to the others and each has its own rationale and limitations. For instance, a case study methodology is undertaken to answer certain questions that cannot be answered through empirical survey. It is carried out to assess the degree of some phenomenon or to collect empirical evidence of this particular phenomenon (Yin, 2014) Figure 1.

Concerning the method used, as given in Figure 1, the majority of the studies, such as British Standards Institution (BSI) (2003), International Integrated Reporting Council (IIRC) (2013), Hahn *et al.* (2015), Laurenti *et al.* (2016), Panagiotakopoulos *et al.* (2016), and Gallotta *et al.* (2016), applied conceptual research methods to design the sustainability frameworks. The conceptual research method is the basis of theory building studies (Xin *et al.*, 2013). The authors relied on the existing literature to develop their frameworks. Some of the authors combined conceptual research with case study or peer review methods to provide a complete picture of analysis, encompassing both the theory building and theory testing aspects of the research that was undertaken. For example, Loorbach *et al.* (2009) and British Standards Institution (BSI) (2003) proposed a transition management framework to analyze the strategic role of the transition management process towards sustainability. As a proof of concept, they presented the case of two companies working in the transition management context dealing with their sustainability problems. They conceptualized a general approach to redefine and reframe the sustainability business strategies. In another work, Ahmed and Sundaram (2012) combined conceptual research with the peer review method to advance the research process and research findings by involving experienced and qualified experts. They validated their frameworks through sessions of peer review by academicians and practitioners. This illustration shows that research that combines several methodologies is useful in providing both the theoretical foundations and the practical usefulness of the results obtained from the research.

In contrast, Heemskerk *et al.* (2002) and Burke and Gaughran (2007) applied case study methods to formulate their frameworks. This involved in-depth observation and analysis of similar situations in other organizations. However, problems of accessibility and time seemed to be the main disadvantages of this methodology. To assess

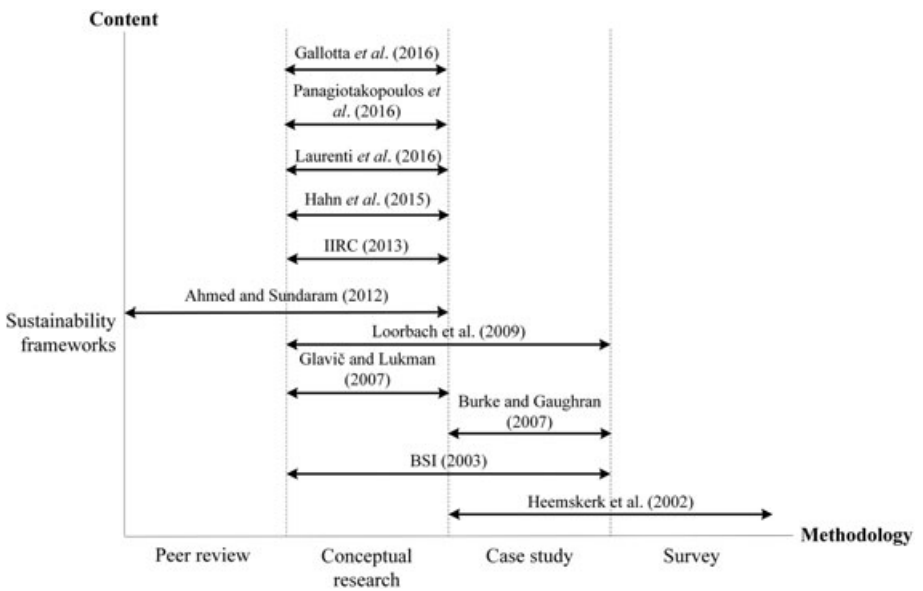

Figure 1. Literature and applied methods

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the applicability of the frameworks, Heemskerk *et al*. (2002) performed a survey in numerous organizations from several countries that are currently tackling their sustainability reports. They provided graphic examples that show the utilization of sustainability reports based on geographical origin and breakdown of reporting types.

Decision-Making Levels

The implementation of sustainability involves the decision-making process in order to manage a sustainable business lifecycle (Ahmed and Sundaram, 2012). It is a challenging task in sustainability implementation, as it engages various levels in an organization. Loorbach *et al*. (2009) considered three various activities and roles in an organization that were conceptualized as strategic, tactical, and operational levels. The fundamental concept of these ideas was based on the concept of decision-making levels in an organization, which were divided into strategic, tactical, and operational levels (Montana and Charnov, 2008). Each level of decision making concerned different issues and scope.

Montana and Charnov (2008) stated that strategic decisions are complex decisions made by senior management that affect the long-term performance of the business and relate directly to the strategic goals and objectives of the organizations. The decisions made at this level can determine how business is linked to the external environment. Since strategic policies affect the entire business, they should be formulated at the highest level within an organization. These policies and objectives are not very specific, because they must be applied to all levels and departments in an organization. In addition, Montana and Charnov (2008) mentioned that tactical decisions are medium-term decisions made by middle-level management such as divisional or departmental managers. These decisions concern the development of plans to complete the strategic goals and objectives defined by senior management. The strategic decisions made by senior management are general because they are applicable in all departments within the organization. However, the tactical decisions articulate corporate objectives in a more specific and concrete manner than strategic decisions and are more action oriented.

Montana and Charnov (2008) defined operational decisions as daily basis decisions made by junior managers that concern on the technical decisions. The operational decisions are administrative in nature and less risky. They are designed to complete the implementation of the strategic and tactical decisions within the organization. Figure 2 presents a graphic representation of the levels of decision making shown for each part of the organization.

Analysis and Discussion

This study proposes a new over-arching principle to review the framework from diverse paradigms, namely the sustainability paradigm (environment, social, and economic) and the decisional paradigm (strategic, tactical, and operational). This study considers the sustainability paradigm in evaluating the existing sustainability frameworks, as the

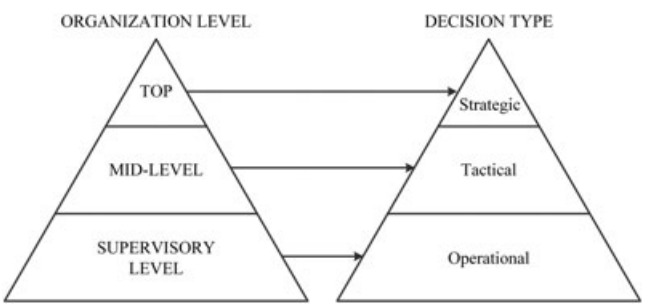

Figure 2. Levels of decision making in an organization (Montana and Charnov, 2008)

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sustainability tasks must support the sustainability paradigm, and all of the dimensions in the paradigm should be managed and measured in order to achieve the sustainability goals and objectives.

The decisional paradigm is also considered in the evaluation as it is required in the sustainable business transformation process. The decision makers in organizations need to have decision-making workflow management to transform the sustainability. This has important implications for the efficiency and effectiveness of sustainability implementation. For this reason, the decisional paradigm is included as one of the criteria to evaluate the frameworks.

Since the objective of a sustainability implementation framework is to guide the practitioners in seeing the perspective of the sustainability implementation, both sustainability and decisional paradigms must be fully integrated in the framework. The integration of these paradigms is critical for a successful sustainability implementation project.

In the related literature, Heemskerk *et al.* (2002) considered both sustainability and decisional paradigms. According to their study, defining the reporting objectives is included in the strategic level. Moreover, planning the report is included in the tactical level. Last, constructing the report, distributing the report, and collecting and analyzing feedback are included in the operational level.

The British Standards Institution (BSI) (2003) considered leadership and vision, and these are included in the strategic level. Similarly to Heemskerk *et al.* (2002), planning activity is considered in the tactical level. In addition, delivery, monitor, review, and report activities are included in the operational level.

In another work, Ahmed and Sundaram (2012) proposed five activities in sustainability business transformation towards sustainability reporting. These activities are discover/learn, strategize, design, transform, and monitor/control. Discover/learn and strategize activities are included in the strategic level. Furthermore, design activity is included in the tactical level. Last, the activities of transform and monitor/control are included in the operational level.

Table 2 summarizes the analysis of existing frameworks based on the sustainability and decisional paradigms. Furthermore, these frameworks are further discussed in order to find the gaps and inconsistencies in the literature.

According to Table 2, all of the studies incorporated the sustainability paradigm into their sustainability implementation frameworks. In contrast, only a few studies considered all dimensions of the decisional paradigm. For instance, Heemskerk *et al.* (2002), British Standards Institution (BSI) (2003) Burke and Gaughran (2007), Loorbach *et al.* (2009), and Ahmed and Sundaram (2012) considered complete decision-making levels. However, Glavič and Lukman (2007) did not consider any decision-making levels in their framework. In addition, International Integrated Reporting Council (IIRC) (2013) and Laurenti *et al.* (2016) only considered the strategic level in the sustainability implementation framework.

Author (year)	Sustainability dimensions			Decision-making levels		
	Environment	Social	Economic	Strategic	Tactical	Operational
Heemskerk *et al.* (2002)	✓	✓	✓	✓	✓	✓
British Standards Institution (BSI) (2003)	✓	✓	✓	✓	✓	✓
Burke and Gaughran (2007)	✓	✓	✓	✓	✓	✓
Glavič and Lukman (2007)	✓	✓	✓			
Loorbach *et al.* (2009)	✓	✓	✓	✓	✓	✓
Ahmed and Sundaram (2012)	✓	✓	✓	✓	✓	✓
International Integrated Reporting Council (IIRC) (2013)	✓	✓	✓	✓		
Hahn *et al.* (2015)	✓	✓	✓	✓	✓	✓
Laurenti *et al.* (2016)	✓	✓	✓	✓		
Panagiotakopoulos *et al.* (2016)	✓	✓	✓	✓	✓	✓
Gallotta *et al.* (2016)	✓	✓	✓	✓		

Table 2. Analysis of existing sustainability implementation frameworks

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In current practice, the majority of international and national problem-solving endeavors focus on one sustainability dimension. For instance, the United Nations Environment Programme (UNEP) and environmental non-governmental organizations (NGOs) focus on the environmental dimension. The World Trade Organization (WTO) and the Organisation for Economic Cooperation and Development (OECD) focus on the economic dimension. Smaller numbers of international and national organizations fully concentrate on all three sustainability dimensions. They do not incorporate these dimensions into their programmes. In achieving true sustainability goals and objectives, however, it is critical for organizations to integrate and balance all three sustainability dimensions in their business. Less attention on one of the dimensions lead to ineffectiveness of the sustainability practices, as all dimensions are interdependent. Therefore, all three dimensions of the sustainability paradigm have to be included in the sustainability implementation frameworks.

The decision-making process is an integral part of the sustainability implementation. According to the Network for Business Sustainability (2012), the decision-making process in sustainability is different from other decisions, as it can be subject to specific biases and errors more frequently than other decisions. Therefore, tackling sustainability issues has not always been successful. An organization needs the influence of all levels of decision makers in managing problem-solving efforts towards sustainable outcomes. An appropriate and advanced decision-making process can achieve the progression of sustainability practices (United Nations Environment Programme, UNEP, 2014). Hence, all three decision-making levels of the decisional paradigm need to be fully integrated in the sustainability implementation frameworks.

Conclusion

Sustainability initiatives are extensively being embedded into the missions and strategies of international and national organizations as awareness of sustainability issues is escalating. In realizing true sustainability, organizations require a comprehensive sustainability implementation framework in order to assist the practitioners in implementing sustainability. To obtain a holistic approach for developing the framework, therefore, this study was performed to review the existing sustainability implementation frameworks and underscore the knowledge gap in the related literature. In addition, this study has proposed an integration of sustainability and decisional paradigms in the frameworks to fully achieve sustainability initiatives.

According to the literature review, the majority of the frameworks considered all dimensions of the sustainability paradigm, but only a few of the studies integrated all levels of the decisional paradigm. In achieving the sustainability goals and objectives, however, a comprehensive framework needs to incorporate both sustainability and decisional paradigms. These paradigms demonstrate the important perspective of sustainability that needs to be considered during a sustainability implementation project. The identification of this perspective will assist the practitioners to comprehend the holistic picture of sustainability implementation.

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