



# Developing a harmonic sustainable public procurement framework

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## Abstract

Sustainability is aimed at addressing the environmental and socio-economic issues of this generation and future ones. In this context, sustainable public procurement (SPP) has been proposed to link the consumption side (government) to the production side (companies), whilst addressing the four dimensions of sustainability (economic, environmental, social, and time). This paper undertakes an analysis, through hermeneutics, of four sets of system elements of SPP: (1) demand-offering, which includes products, services, and their combination; (2) procurement specifications (technical, non-technical, and socio-cultural); (3) stakeholder interactions; and, (4) research disciplinary approaches. The analysis shows that despite most SPP efforts focussing on demand-offerings or specifications, there have been some framework proposals aimed at explaining the complexities and interactions between the system elements. Additionally, most research on SPP has been carried out through single disciplinary approaches. The paper proposes the Harmonic SPP framework, which integrates the demand-offering, specifications, stakeholder interactions, disciplinary approaches, and the four sustainability dimensions, where the harmonisation of their interrelations is *sine qua non*. The Harmonic SPP framework is aimed at providing a more holistic perspective to SPP and thus fostering more effective and efficient SPP research and implementation.

**Keywords** Sustainable public procurement · Disciplinary approaches · Specifications · Stakeholder interactions · Sustainability · Demand-offering · Product service systems

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# 1 Introduction

Sustainability is aimed at meeting the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987). This has to be achieved through holistic (see Hjorth & Bagheri, 2006; Hopwood et al., 2005; Mebratu, 1998) and transdisciplinary approaches (Lozano, 2008, 2014; Shrivastava et al., 2013) that balance the economic, environmental, and social dimensions of this and future generations (WCED, 1987), as well as their interconnections (Lozano, 2008).

In this context, the United Nations Environmental Programme (UNEP) has been promoting sustainable public procurement (SPP), through efforts aimed at linking the consumption side, through governmental public procurement (PP), to the production side, through the development of more sustainable business models (SBM) (UNEP, 2014). SPP initiatives have contributed to sustainability in several countries (European Commission, 2016; World Bank, 2021), as developing a more environmentally-friendly and 30% more durable asphalt in Brazil (Betioli et al., 2015), reducing by 85% the CO<sub>2</sub> emissions of a city's bus transportation after introducing biogas powered vehicles in Finland (Nordic Council of Ministers, 2021), and reducing the lighting cost and consumption in schools by approximately 50% in Sweden (Lozano et al., 2020).

The incorporation of sustainability requirements is paramount to SPP processes (Brammer & Walker, 2011). This incorporation has indirect effects on product development and on consumer demand for more sustainable products (Parikka-Alhola, 2008), as well as how these products impact societies (Preuss, 2009; Srivastava, 2007). The procurement process, generally, has the following stages (see UNEP, 2021): (1) procurement planning (needs assessment, definition of products and services, and market research); (2) requirement definition (products and services' specifications and award criteria); (3) sourcing (competitive phase, tender evaluation, supplier selection, and contract signature); and (4) contract management (products and services' delivery and supplier performance monitoring).

SPP discourses and efforts have focussed on the following elements: (1) demand-offering<sup>1</sup> (e.g. Parikka-Alhola, 2008), (2) specifications (see Thai, 2009), (3) stakeholder interactions (such as Alhola et al., 2017), and (4) disciplinary approaches (for example Ferk & Ferk, 2018; Günther & Scheibe, 2006; Sanchez-Graells, 2018). Most efforts have taken a compartmentalised approach, i.e. addressing only one of the elements, with some limited exceptions such as demand-offering and some disciplinary approaches (for example Wesseling & Edquist, 2018) and specifications and stakeholder interactions (see Witjes & Lozano, 2016).

The aim of this paper is to develop a frame work considering the interactions between demand-offering, specifications, interactions, disciplinary approaches, and the four sustainability dimensions (i.e. economic, environmental, social, and time). Section 2 discusses hermeneutics as a method of analysis. Section 3 presents the demand-offering in SPP. Section 4 discusses the different categories of products and services' specifications in SPP. Section 5 presents the interactions that support SPP. Section 6 describes the approaches used to address SPP. Section 7 integrates the different elements of SPP to propose the Harmonic SPP framework. The last section presents the conclusions of this paper.

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<sup>1</sup> Demand-offerings represent the transactional relationship between buyers (demanding) and suppliers (offering) regarding the exchange of products or services for an agreed sum of money (Baily et al., 2015).

## 2 Hermeneutics as a method of analysis

The social sciences can create meaning and contribute to knowledge by analysing, explaining, and contextualizing problems, benefiting from a dialectical process of interpretation and reinterpretation of social phenomena (Heller, 1989). Social phenomena are highly complex and have a multi-dimensional nature, which is formed by individual experiences and their historical contexts, allowing different interpretations (Gibbons, 2006).

The interpretation of a social phenomenon is externalised through language, speech, and communication (Gadamer, 1975). The explanation of a social phenomenon includes to understand the phenomenon and to present a narrative of the phenomenon, identifying the key factors that led to it (Hay, 2011). The presentation of a narrative of a social phenomenon involves three interdependent activities: (1) understanding (*subtilitas intelligendi*), (2) interpretation (*subtilitas explicandi*), and (3) application (*subtilitas applicandi*), in a process where researchers' technical know-how (*techne*) and ethical know-how (*phronesis*) are present (Bernstein, 1982).

Hermeneutics is an inductive approach to analyse texts and their internal consistency, and is used for interpretation in social sciences (Baškarada & Koronios, 2018). Hermeneutics is based on the inquiry into the conditions of human understanding (Harrington, 2001; Heidegger, 1996; Leyh, 1988). Hermeneutics guides social scientists to a meta-interpretation work (Dreyfus, 1980), i.e. an interpretation of inner realities formed by individual experiences, their historical contexts, and their own interpretations (Dilthey, 1972). This meta-interpretation is essential to provide a critical understanding of a social phenomenon, especially when facing competing discourses motivated by conflicting understandings (Dreyfus, 1980).

Hermeneutics can help to analyse understandings and provide valid interpretations, accepted by a research community (Moules, 2002); however, it is bound by the researcher's experience (Dilthey, 1972). Hermeneutics' acceptance in research communities has been fostered by providing a holistic perspective (Gibbons, 2006), by which the whole can only be understood and explained from its parts and their interconnections, and vice-versa (Dilthey, 1972; Gadamer, 1975; Harrington, 2001; Schleiermacher, 1998).

According to Heller (1989), there are different types of explanations arising from hermeneutics, which can be categorised into three clusters: (1) explanation with efficient causes, based on general laws; (2) explanation with final causes (*causa finalis*), supported by ideal types and theoretical systematisations; and (3) explanation with formal causes (*causa formalis*), balancing explanation and interpretation.

SPP discourses, as social phenomena, have, generally, been explained by disconnected discourses on the elements and approaches. Such discourses can be better understood and interpreted through hermeneutics' holistic perspective. Hermeneutics has been used in sustainability discourses, for example to understand and explain theories of the firm to provide a holistic perspective for company engagement into sustainability (see Lozano et al., 2015).

The approach used in this paper has some limitations. Each SPP discourse is presented in a non-exhaustive way due to formal limitations (e.g. size of a scientific journal paper). Reliability in this paper may be affected by observer error and bias given the nature of the method, including the influence of researchers' values (as discussed by Heller, 1989), perceptions (see Moules, 2002), and experience (proposed by Dilthey, 1972). Validity in this paper, especially external validity, or generalisation, is limited by the context where the SPP discourses were developed and the context of this research.

### 3 SPP demand-offering

A key element of SPP is demand-offering, which should be sustainability-oriented (Fisher, 2013; UNEP, 2021). Four demand-offering categories can be found in the SPP literature: (1) products; (2) services; (3) functions; and (4) needs.

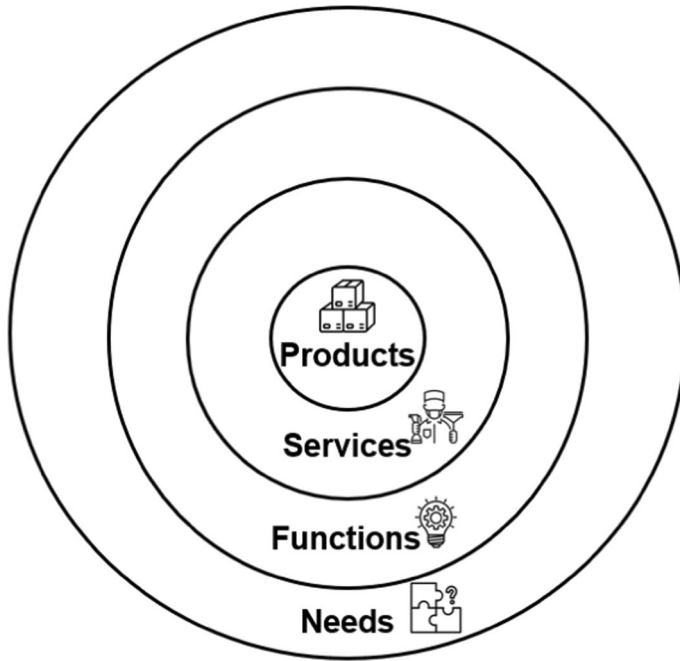
The products category focusses on how to consider sustainability issues in the production process of products (Amann et al., 2014), contributing to the development of sustainable supply chains (Preuss, 2009). Products are tangible materials which can be circulated and used, resulting from a production process (Callon et al., 2002).

The services category is based on transforming services to incorporate sustainability issues in production and consumption processes (Anttonen et al., 2013). Services are processes intended to change the condition of a person or a product (Hill, 1977), characterized by intangibility, a high degree of suppliers' personnel resources involved, and, often, a relationship between buyers and suppliers (Ancarani, 2009; Pelkonen & Valovirta, 2015). In SPP demand-offering discourses, there has been a focus on a transformation from products to a combination of products and services, as explained by the Product-Service System (PSS) (Witjes & Lozano, 2016). PSS is aimed at reducing the total environmental burden of consumption (Mont, 2002), in order to use resources more efficiently (Beuren et al., 2013). PSS approaches require close collaboration between producers and consumers (Lozano et al., 2013) and changes in the levels of information exchange between stakeholders, as well as in the nature of relationships between them (Lockett et al., 2011). A key element in embedding PSS into SPP is collaboration between buyers and suppliers (Witjes & Lozano, 2016).

The functions category proposes that SPP requirements are based on setting suppliers' performance through functional requirements instead of basing it on describing products and services (Georghiou et al., 2014; Uyerra et al., 2014), which could be defined as Functional Product-Service System (FPSS). FPSS is aimed at providing solutions to the needs presented by buyers through addressing such functional requirements (Alhola et al., 2017; Edquist & Zabala-Iturriagoitia, 2012). FPSS requires a design performed by interactions between stakeholders (Tuli et al., 2007), which intensity will vary depending on the complexity of the sustainability needs to be satisfied (Nordin & Kowalkowski, 2010).

The needs category is based on analysing problems and proposing expected outcomes, allowing flexibility for the selected supplier to implement the contract (Thai, 2009). In this case, SPP potential suppliers present their different solutions to fulfil the buyers' needs and the contract is awarded to the supplier and solution that are most suitable to the pre-defined criteria arising from the functional specifications, the problems, and the expected outcomes through collaboration between stakeholders (Lozano et al., 2020). The needs demand-offering is important during the competitive dialogue, a supplier selection procedure set up when the buyer recognises different potential solutions (Nordic Council of Ministers, 2021; European Union, 2014). The competitive dialogue entails a series of structured interactions between procurers and potential suppliers to explain the needs and analyse potential solutions, leading to a competition between different solutions (Uttam & Le Lann Roos, 2015). In the needs category, public buyers have a high discretion<sup>2</sup> while translating sustainability needs to procurement requirements, as PP legislation is more concerned with how to buy (process), not with what to buy (subject-matter of public contract) (European Commission,

<sup>2</sup> Discretion in public procurement is the empowerment of public buyers during decision-making processes, reducing the rules which regulate their behaviours and trusting in their judgments, while holding them accountable for the results of their actions (Kelman, 1990).



**Fig. 1** SPP demand-offering system (DOS)

2016). That high discretion explains the attention given by SPP manuals to needs assessment and specifications (European Commission, 2011; UNEP, 2021), which are the basis for constituting the demand-offering.

Figure 1 illustrates how the demand-offering categories in SPP are embedded in a demand-offering system (DOS), which shows that products are part of services, these, in turn, are part of functions, and these are part of the needs.

#### 4 SPP specifications

SPP requires that sustainability issues are incorporated into procurement specifications (Cheng et al., 2018; Edquist & Zabala-Iturriagoitia, 2021). According to EU Public Procurement Directive (European Union, 2014), technical specifications of the demanded products and services describe their characteristics, including quality levels, performance levels, and production processes. Technical specifications are written in terms of descriptive and functional requirements, are relevant for evaluating the admissibility of a tender, shall promote competitiveness, and can include sustainability issues.

Thai (2009) proposes five types of technical specifications, divided into products and services:

- (1) *Products*

- (1) Detailed specifications of products embrace design specifications, commercial standards, and engineering drawings (descriptive requirements); and
  - (2) Other purchase descriptions are focused on products' brand names or equivalent specifications, samples, and functional specifications, the last describing what the product is expected to do, not its design characteristics (functional requirements).
- (2) *Services*
- (3) Statement of work describes how services shall be performed, including expected products (descriptive requirements, demand-offering of services);
  - (4) Performance work statement designs performance standards and monitoring plans (functional requirements, demand-offering of functions); and
  - (5) Statement of objectives describes problems to which potential suppliers can offer different solutions (functional requirements, demand-offering of needs).

In addition to technical specifications, there can be non-technical and socio-cultural ones (Witjes & Lozano, 2016). Non-technical specifications refer to how the suppliers should provide the products and services (European Commission, 2016), including on-site installation, maintenance, end-of-life take back, and buyer's personnel training for using the products and services (provision requirements). Socio-cultural specifications refer to the expected behaviour and attitudes of the supplier's employees responsible for interacting with the buyer's teams during the procurement process (interactions requirements), which can foster co-creation through making information accessible and sharing it (Borgatti & Cross, 2003; Borgatti & Foster, 2003).

The EU Public Procurement Directive (Directive 2014/24/EU) does not state about non-technical and socio-cultural specifications, although they derive from the technical ones (European Union, 2014). The three specifications' categories are linked to the subject-matter of the contract, but their contents are different and only the technical ones refer to the material substance of products and services (European Commission, 2021).

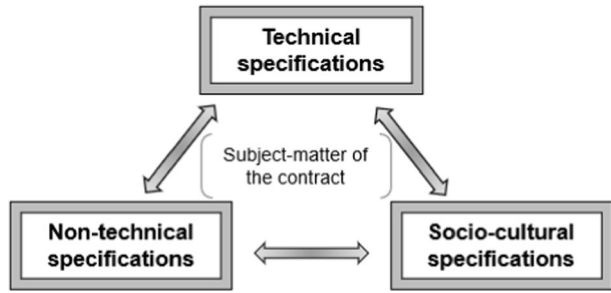
The interconnections between technical, non-technical, and socio-cultural specifications are presented in Fig. 2.

## 5 Stakeholder interactions in SPP

Traditional PP addresses the interactions solely between buyers and suppliers, which encompass demand-offerings and mutual relationships arising from a business relation (Baily et al., 2015). In SPP, other stakeholders (e.g. academia, civil society, and the environment) must also be considered, leading to a change from a traditional and linear process to a more collaborative and circular one (Lozano et al., 2020). The former refers to limited relationships between stakeholders during the procurement process, especially in activities such as market research, supplier selection stage, and supplier performance monitoring, which are considered more in line with the equal treatment and non-discrimination principles of PP<sup>3</sup> (McCue & Gianakis, 2001). The latter results in benefits from knowledge exchange and co-development of solutions during the entire procurement process (Witjes

<sup>3</sup> As an example of PP's principles, the Directive 2014/24/EU states that buyers shall treat potential suppliers equally and without discrimination, promoting competitiveness during the procurement process.

**Fig. 2** Interconnections between technical, non-technical, and socio-cultural specifications in SPP



& Lozano, 2016), while maintaining competitiveness and abiding to the principles of procurement legislation (Holma et al., 2020).

Different proposals and frameworks have been suggested to explain stakeholder interactions in SPP (United Kingdom Department of Environment, 2006), particularly focussing on the planning stage (see Katriina Alhola & Nissinen, 2018; Holma et al., 2020; Uenk & Telgen, 2019; Vluggen et al., 2020; Wondimu et al., 2020).

One of the most complete frameworks illustrating the potential of collaboration in SPP was proposed by Witjes and Lozano (2016), the Procurement and business model collaboration for circular economy (ProBiz4CE), where the interactions between buyers and suppliers develop more SBMs and promote circular economy solutions. This framework encompasses the co-development of procurement specifications and shared responsibility for managing the life cycle of products and services, reducing the amount of raw materials needed and waste generated.

An expanded version of the ProBiz4CE (Fig. 3) incorporated several stakeholders (academia, civil society, and the environment) as facilitators to develop innovative solutions through SPP (Lozano et al., 2020). Such facilitators can help to implement sustainability, whilst balancing collaboration benefits and challenges.

The interactions between buyers and suppliers in SPP, considering the potential of enhancing the procurement process by including other stakeholders, are presented in Fig. 4.

## 6 SPP disciplinary approaches

Different disciplinary approaches have been used for SPP research; however, they have been based mainly on a single academic discipline (Grandia & Kruyen, 2020; Patrucco & Luzzini, 2017; Sönnichsen & Clement, 2020).

From the literature, it is possible to distinguish nine approaches: (1) technical, (2) public policy, (3) legal, (4) economic, (5) management, (6) marketing, (7) behavioural, (8) societal, and (9) institutional.

The technical approach focusses on actions directed to specifying technical requirements considering sustainability issues, such as local preferences (Ferk & Ferk, 2018), functional requirements (Wesseling & Edquist, 2018), whole life cost of products and services (Czarneski & Van Garse, 2020), and sustainable labels (Koszsewska, 2020).

The public policy approach is aimed at integrating sustainability policies on SPP practice and to translate public policy and citizens' demands into procurement requirements (Wesseling & Edquist, 2018). This approach also prescribes the incorporation of

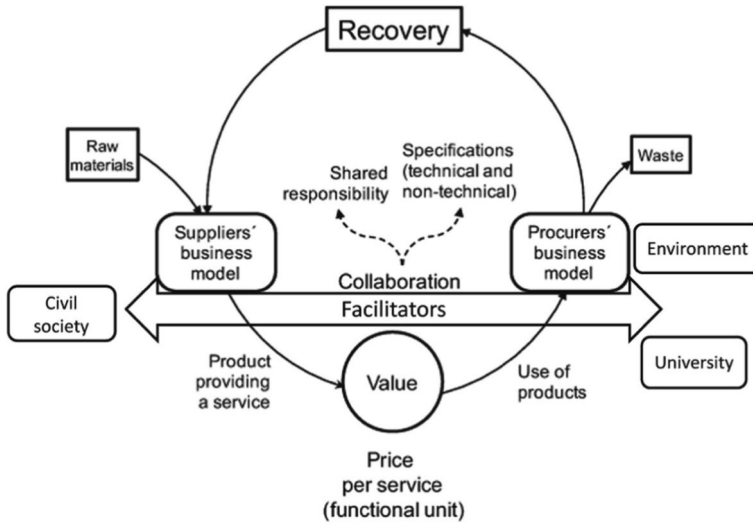
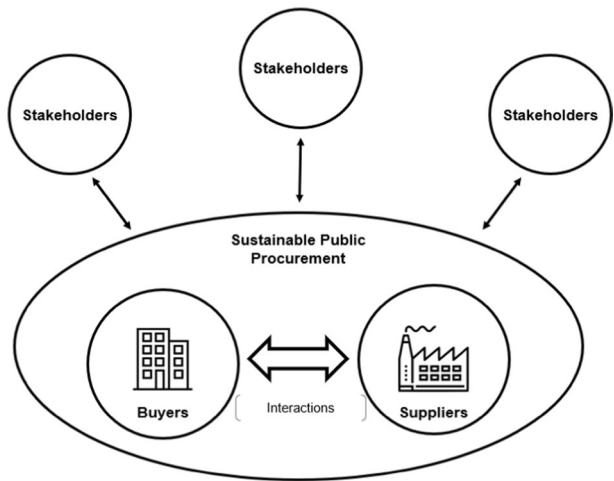


Fig. 3 SPP based on a collaborative quintuple helix framework. Source (Lozano et al., 2020)

Fig. 4 Stakeholders' interactions in SPP

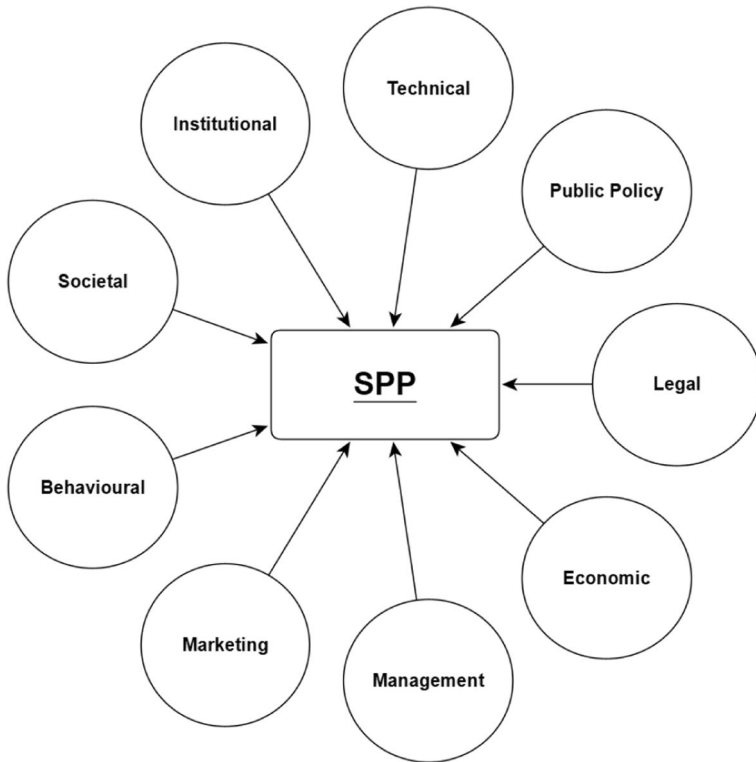


sustainable policies' goals as public organisations' targets to align and support decisions regarding sustainability requirements (Sparrevik et al., 2018).

The legal approach entails actions that build and interpret normative boundaries for promoting SPP standards (Ferk & Ferk, 2018; Sanchez-Graells, 2018; United Kingdom Department of Environment, 2006), considering that sustainability-driven legislation is not automatically incorporated into procurement practice (Chiarini et al., 2017).

The economic approach focusses on looking for an optimum considering different factors such as risk, timeliness, and cost for the public organisation (Sönnichsen & Clement, 2020), transitioning from a PP based on purchasing at the lowest price, to a SPP that considers other issues, such as the whole life cycle of the product (Tarantini et al., 2011).





**Fig. 5** Disciplinary approaches to SPP research

The management approach is based on plan-do-check-act process, prescribing actions, such as organisational changes (United Kingdom Department of Environment, 2006), strategic guidance (Günther & Scheibe, 2006), leadership (Brammer & Walker, 2011), and professionalisation (Oruezabala & Rico, 2012).

The marketing approach is based on anticipating consumers and suppliers' behaviour during and after SPP processes, which can eventually reduce or eliminate the positive spill-over effects (Lundberg et al., 2016).

The behavioural approach focusses on promoting procurers' sustainability-friendly attitudes and behaviours, beyond the knowledge and abilities provided by professionalisation (Grandia, 2016). This approach is based on empowerment, motivational energy, and attitudes toward sustainability issues to improve the procurers' performance, considering a high impact of procurers' behaviour on implementing SPP (Eikelboom et al., 2018; Igarashi et al., 2017).

The societal approach is aimed at regulating the market through PP to develop social justice, including human rights, gender equality, and globalization issues, as a basis for a broader implementation of SPP (McCrudden, 2004). This approach focusses on concepts such as vulnerable populations, unequal labour relations, ethnic background, and solidarity to balance the sustainability dimensions through SPP (Sonnino, 2009).

The institutional approach, represented by SPP guidelines published by international organisations, disseminates best practices and success cases based on different experiences

(European Commission, 2016, 2021; UNEP, 2012; World Bank, 2021). The knowledge provided by these institutional guidelines can be a driver for implementing SPP (Testa et al., 2016). This approach indicates that international organizations play a more active role on stimulating the implementation of SPP, although initially criticized as *status quo* defenders (Hopwood et al., 2005).

Figure 5 illustrates the disciplinary approaches to SPP research. It should be noted that the interactions between the approaches should be further explored.

### 7 Holistic framework of SPP

The insights from the previous four sections can be understood (*subtilitas intelligendi*) and interpreted (*subtilitas explicandi*) through hermeneutics to provide an explanation that is based on supported ideal types and theoretical systematisations, i.e. with final causes (*causa finalis*), of SPP discourses to propose the Harmonic SPP framework (Fig. 6), which integrates the following system elements: (1) demand-offering (including products, services, functions, and needs); (2) specifications (with technical, non-technical, and

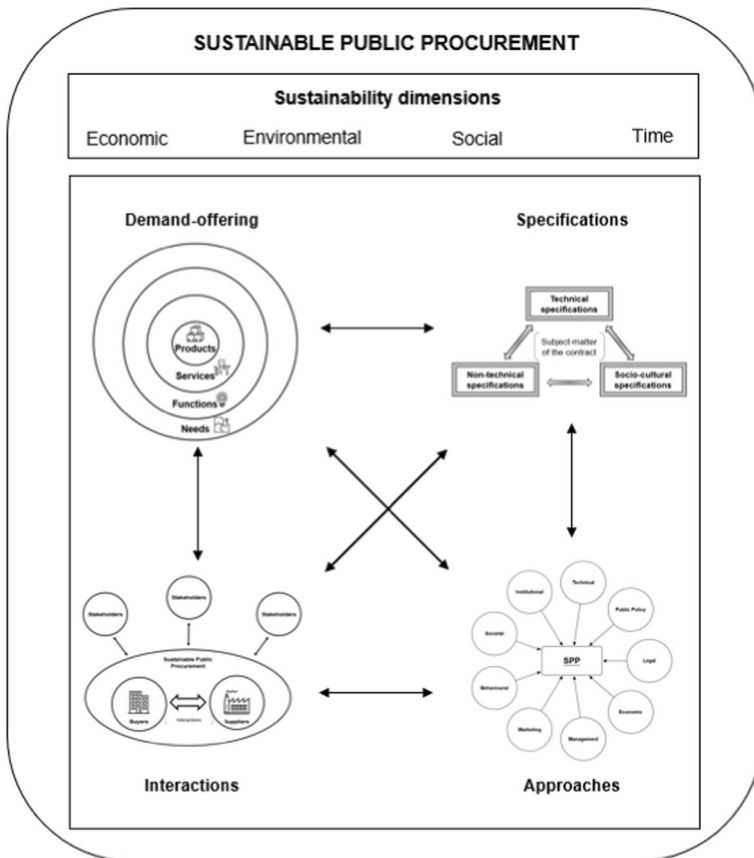


Fig. 6 The Harmonic sustainable public procurement framework

socio-cultural ones); (3) stakeholder interactions (buyers, suppliers, and other stakeholders); (4) disciplinary approaches (technical, public policy, legal, economic, management, marketing, behavioural, societal, and institutional); and (5) sustainability (economic, environmental, social, and time dimensions). The framework is based on the interrelations within and between system elements to fully capture the complexity of SPP. The harmonisation of the interrelations between the demand-offering, specifications, stakeholder interactions, disciplinary approaches, and the four sustainability dimensions is *sine qua non* in achieving SPP. The Harmonic SPP framework provides a better understanding of SPP complexity where the system elements and their interactions are explicitly considered. The Harmonic SPP framework offers a more holistic perspective to SPP than the ProBiz4CE updated version (see Lozano et al., 2020; Witjes & Lozano, 2016).

## 8 Conclusions

Sustainability is aimed at addressing the environmental and socio-economic issues of this generation and future ones. In this context, SPP has been proposed as a way to link the consumption side (government) to the production side (companies), whilst addressing the four dimensions of sustainability.

A key element of SPP is the demand-offering, which includes products, services, and their combination, where four demand-offering categories can be found (products, services, functions, and needs). The demand-offering requires that sustainability issues are incorporated into procurement specifications (technical, non-technical, and socio-cultural). In parallel, different proposals and frameworks have been suggested to explain stakeholder interactions in SPP, ranging from the supplier–buyer dichotomy to integrating the perspectives from multiple stakeholders. SPP research has been undertaken through a number of disciplinary approaches. Despite such efforts, SPP research has focussed only on demand-offerings or specifications, with limited number of frameworks offered to understand its complexities and interactions. At the same time, most research on SPP has been carried out through single disciplinary approaches.

This paper proposes a holistic framework, developed through hermeneutics, to interconnect SPP system elements and explain in a clearer way the complexity of SPP. The Harmonic SPP framework is based on theoretical systematisations of demand-offering, specifications, stakeholder interactions, disciplinary approaches, and the four sustainability dimensions, where the harmonisation of their interrelations is *sine qua non*. The Harmonic SPP framework is aimed at providing a more holistic perspective to SPP and thus fosters more effective and efficient SPP research and implementation.

An analogy of the Harmonic SPP framework is a composer's creativity, who creates a beautiful symphony (SPP in this case) by harmonising notes (e.g. the elements in the demand-offering, or the stakeholder interactions) and chords (i.e. the demand-offering, specifications, stakeholder interactions, disciplinary approaches, and sustainability's dimensions) through a melody of complex interactions. In this harmonic way, SPP can better contribute to making societies more sustainable.

Further research should explore the implementation of the Harmonic SPP framework, disciplinary approaches interactions, organisational impacts of adopting a holistic view of SPP, change management perspective for applying a more complete understanding of SPP, drivers for building a harmonic and purposeful SPP, and barriers to SPP.

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**Data availability** Data sharing not applicable to this article as no datasets were generated or analysed during the current study.

## Declarations

**Conflict of interest** The authors have no competing interests to declare that are relevant to the content of this article.

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