



Stimulating a more Circular Economy through Public Procurement: Roles and dynamics of intermediation

Dr. Anne Rainville

Copernicus Institute of Sustainable Development, Utrecht University, Princetonlaan 8a, 3584 CB Utrecht, The Netherlands

ABSTRACT

Public procurement can accelerate transitions to a more circular economy by creating new demand for resource efficiency. Interactions during pre-procurement consultations influence the impact of such purchasing by helping define tender specifications. Intermediation throughout these processes can facilitate interactions between participants, assisting in sourcing, generating, and translating knowledge. However, roles for intermediaries and dynamics of intermediation are not fully understood. This paper intends to address how intermediation can promote a more circular economy. It examines a pilot project led by the Dutch Ministry of Defence to incorporate post-consumer recycled content in textiles through extensive consultation activities. Eighteen in-depth interviews were conducted with those directly involved in the pilot, and analyzed using constant comparative analysis. Six intermediaries were identified and found to play a critical role in the process by 1) coordinating government and industry through aligning project goals, 2) facilitating cooperation of industry players to stimulate new business relationships, and 3) collaborating with the buyer to push for higher post-consumer recycled material in the final tender. With respect to public demand articulation, greater insight is needed to discover how to best combine buyers' motivations for cost savings, sellers' motivations of increased returns, and the sustainability requirements often imposed by third parties. These dynamics may mark transitions toward circularity as further projects arise, offering a more permanent role for intermediation.

1. Introduction

Furthering sustainable development through a more circular economy requires improving resource efficiency by prolonging the value of products or services within supply chains markets (EC, 2014a). Connecting production and consumption to add value to waste materials can drive these improvements by reducing the amount of raw materials needed. Products or services that are part of a circular economy are attractive to buyers, as they provide new revenue streams while reducing costs (EC, 2014a). However, the circular economy model has not been proven in many sectors, and the need for agreement between players *before* products are on the market creates uncertainty regarding effective consultation processes. Coupled with the high potential of the model, its nascency in private markets creates opportunities for demand-side intervention to increase the uptake of products and services that are part of circular supply chains.

Public procurement activities can drive sustainable development by creating demand-side pressure in markets (Testa et al., 2012). The demand created via all types of public procurement is sizeable, amounting to up to 19% of GDP across Europe (ERAC, 2015). Leveraging public demand for a more circular economy depends on contracting authorities' ability to integrate information which has been captured during various activities undertaken or participated in during the procurement planning process, in the pre-procurement phase. However, public

agencies are often limited in their internal knowledge (Georghiou, Edler, Uyarra, & Yeow, 2014), which can hinder environmental benefits of procurement through inadequate technical specifications and award criteria (Rainville, 2016a).

Consultations of external groups, including potential suppliers, other government agencies, and experts is one means by which to supplement internal knowledge and improve procurement outcomes. With respect to innovation procurement, Rolfstam (2009) views this as a type of "user-producer interaction" (von Hippel, 1988) or "interactive learning" (Lundvall, 1992). These interactions transfer information across institutional boundaries to further learning (Rolfstam, 2012), which in turn is associated with higher project performance (Henderson & Cockburn, 1994). Despite this, such consultation is not common across Europe (Rainville, 2016b). When it does occur, interactions are often through negotiated procedures (Kiiver and Kodym, 2014) rather than more open discussions of sustainability, such as long-term consideration of raw materials or material wastes. For public procurements of products that are part of circular supply chains, the effectiveness of pre-procurement consultation becomes an integral success factor in the ensuing procurement and its market impacts.

Intermediation can facilitate such consultation processes in public procurement (Edler & Yeow, 2016). Edler and Yeow (2016) discuss *intermediation* as that which can "establish or enable the link between different actors with complementary skill sets or interests" (p. 414),

E-mail address: amrainvi@gmail.com.

<https://doi.org/10.1016/j.respol.2020.104193>

Received 12 January 2018; Received in revised form 16 July 2020; Accepted 23 December 2020

Available online 9 January 2021

0048-7333/© 2021 Elsevier B.V. All rights reserved.

focusing on roles of multiple intermediaries in supporting “the generation and diffusion of innovation” (p. 414) through public procurement. As the individual or institution carrying out intermediation activities, an intermediary provides support for interconnected functions required to further a project. According to [Howells \(2006\)](#), intermediaries can be organizations serving as brokers, third parties, and agencies that help support the innovation process. Intermediaries can serve sustainability transitions through taking a systemic role in acting multilaterally within networks ([van Lente et al., 2003](#)), moving beyond the role of information broker between buyer and supplier. Others have referred to intermediaries as *change agents*, such as [Grandia \(2015\)](#), who examines their role in promoting sustainable procurement pilot projects. Change agents are defined by [Caldwell \(2003\)](#) as “an internal or external individual or team responsible for initiating, sponsoring, directing, managing or implementing a specific change initiative, project or complete change programme” (pp. 139-140).

Intermediation has also been discussed in more detailed terms of interactions, such as facilitating process of coordination, cooperation and collaboration. *Cooperation* is defined by [Klerkx and Leeuwis \(2009\)](#) as mutual engagement and alignment of the “multi-actor network” (p. 891). Through cooperation, participants learn from each other and share experiences. *Collaboration* is a “recursive process where people or organizations work together in an intersection of common goals by sharing knowledge, learning, and building consensus” ([Dietrich et al., 2010](#), p. 60). According to [Dietrich et al. \(2010\)](#), *coordination* is a quality indicator of collaboration for “shared understanding” (p. 67) of goals, activities, and contributions.

However, literature has not deeply investigated these dynamics of intermediation for how to facilitate public procurement, including projects for a more circular economy. The related concept of (technology) “champions,” such as individuals who promote an innovation intraorganizationally ([Lawless & Price, 1992](#)), has been identified by [Rolfstam \(2009\)](#) in connection to innovation procurement. However, it has not been elaborated or applied to interorganizational, circular, or sustainability topics in the public procurement literature.

This paper examines intermediation throughout the pre-procurement consultation process of a national public procurement pilot project to support a more circular economy. It addresses the following research question through an exploratory case study in this nascent field:

In what ways can the roles and dynamics of intermediation promote a more circular economy through public procurement?

Intermediaries in the project defined the potential for suppliers to incorporate post-consumer recycled content in textiles, and helped translate this information into a tender call. The project enabled the analysis of broader and more complex interactions between intermediaries and firms, governments, and NGOs over time. To identify intermediation dynamics and roles for intermediaries, in-depth interviews were conducted, and constant comparative analysis (CCA) was used to highlight convergence and divergence from literary constructs. Results are displayed according to stages of the pilot project. Together, the conclusions further the understanding of intermediation in public demand articulation and in promoting a more circular economy.

The paper is structured as follows. [Section 2](#) presents the conceptual background and literature review on intermediation and consultation used to ground the analysis; [Section 3](#) presents the methods, case selection, data collection, and analysis. [Section 4](#) presents the findings, and [Section 5](#) the discussion. Conclusions in [Section 6](#) complete the paper and highlight the implications of this novel research for further analyses.

2. Intermediation by Stages, Roles, and Interactions

Literature on roles for intermediaries explicates potential rationales for intermediary involvement, upon which further details on the nature of their interactions can be defined. Constructs can help distinguish

between different roles according to an intermediary’s skillset or project needs, for instance. Further details can provide information on the dynamics of intermediation according to different types of interactions that may occur with an intermediary in their system or network.

Identifying these features according to project stages connects intermediary activities to project progression. Examining change agents, [Grandias \(2015\)](#) discusses “stages” of resistance, exploration, and commitment, alongside “phases” of unmoving, moving, and freezing. These constructs have parallels with degrees of openness ([Dietrich et al., 2010](#)), formalization, and codification ([Geels & Deuten, 2006](#)) according to project stage. This paper uses the above to ground findings regarding intermediation and interactions according to project stage.

2.1. Intermediary Roles in Projects

The ways in which intermediaries help to further projects depends in part on their roles and characteristics. [Edler and Yeow \(2016\)](#) define three types of intermediation: demand articulation, actor and linkage formation, and innovation process management. [Van lente et al. \(2003\)](#) differentiate between three types of intermediaries, depending on roles: 1) *hard* intermediaries, articulating technical possibilities; 2) *soft* intermediaries, articulating business and innovation strategies; and 3) *systemic* intermediaries, articulating demand and strategy development. While all three of the latter include activities of articulation, alignment, and learning, *systemic* intermediaries have additional roles of “Identifying, mobilizing and involving relevant actors; Organizing discourse, alignment, and consensus; [and] Management of complex, long-term innovative projects” ([van Lente et al., 2003](#), p.11).

In empirically testing types of intermediaries defined by [Van lente et al. \(2003\)](#), [Edler and Yeow \(2016\)](#) identify four roles for intermediaries in public procurement particularly: 1) *performers* of the project or purchase, 2) *brokers* linking externally to markets and internally within organizations, 3) *content experts* with technology, market, and diagnostic expertise, and 4) *trainers* building up buyer capacity for future projects. Their roles are further shaped by the market effect of the procurement, distinguished by those which trigger or respond to an innovation. The concept of (technology) champions

Transferring knowledge is a key function of intermediaries, as they develop and disseminate particular information collected to actors ([van Lente et al., 2003](#)). In this sense, the concept of intermediaries as *brokers* has been well-established. Brokers act within “multi-party, learning-action networks” ([Clarke & Roome, 1999](#), p. 296) to transform information on technology and markets ([Hargadon & Sutton, 1997](#)). Social network theory supports that these brokers benefit from negotiation, creating relationships to fill structural holes ([Burt, 1992](#)) which create knowledge gaps between individuals, organizations, and sectors. Similarly, [Geels and Deuten \(2006\)](#) see a key function of “intermediary actors” as knowledge aggregation, through the codification of tacit knowledge. In this sense, intermediaries can include standardization institutes, industry associations stimulating technical knowledge production, and firms who are involved across multiple “local practices” ([Geels & Deuten, 2006](#)). [Meulen and Rip \(1998\)](#) consider an expanded role for intermediary institutions between the operational and policy level, in “ecologies” where institutes coordinate horizontally.

Intermediaries can also create conditions enabling the *creation* of knowledge gained through experience ([van Lente et al., 2003](#)), summarized by [Howells \(2006\)](#) as “knowledge processing, generation, and (re) combination” (p. 721). Intermediation facilitates “learning and cooperation in the innovation process” to achieve “alignment and learning of the multi-actor network” ([Klerkx and Leeuwis, 2009](#), p. 851). [Clarke and Roome \(1999\)](#) discuss learning-action networks for sustainable purchasing as based on relationships that “lay over and compliment formal organizational structures linking individuals together by the flow of knowledge, information, and ideas” (p. 297).

Applied to public procurement, this literature suggests that government agencies can use the process of intermediation – through the use of

intermediaries – to work within a given system or network, facilitating the creation and codification of knowledge as part of demand articulation.

2.2. Dynamics of Intermediation

Interactions in public procurement has been examined mainly with respect to public procurement partnerships (e.g., [Erridge & Greer, 2002](#); [Essig, 2005](#); [Lawther, 2005](#); [Walker, 2008](#)), rather than broader consultation prior to procurement. Literature on public-private partnerships substantiates that trust “facilitates action” in the same way as authority (for governments) and prices (for markets) ([Lawther, 2005](#)). It builds social capital ([Essig, 2005](#)) and can improve connectivity between public, private, and non-profit actors ([Erridge & Greer, 2002](#)). Partnerships with suppliers and the trust those are based on are “paramount” to including social and environmental factors in the purchasing process ([Walker, 2008](#), p. 1605).

The focus of the aforementioned literature on one-to-one partnerships has discounted any interactions of intermediaries within systems or networks. Under the New Public Management paradigm, government works more closely with businesses, social enterprises and NGOs ([Walker, 2008](#)), and cooperation with these actors can generate knowledge to be incorporated in public procurement ([Essig, 2005](#)). Considering relationships in these more complex environments, [Edler and Yeow \(2016\)](#) see the information provision role of intermediaries as driven by the creation of “awareness and transparency” by intermediaries, supporting the creation of “market enabling communication and trust between the parties” (p. 416). In this way, social capital is a key component of intermediation, as it can improve linkages between government, market, and non-profit actors ([Erridge & Greer, 2002](#)).

A central challenge to public procurement is balancing procurement goals with competition ([Rainville, 2016a](#)). Market players can provide information used to better design a tender call, which must preserve fair competition while promoting other goals such as a more circular economy. Public procurement has undergone a shift from simple market consultation toward “relationship contracting,” which includes “collaboration, networks, strategic alliances, [and] partnerships” ([Lawther, 2005](#), p. 213). Collaboration in pre-procurement initiatives to inform demand can serve as a modern form of competition ([Hartman et al., 1999](#)) to bring in market information to procurement processes. [Edquist and Zabala-Iturriagoitia \(2012\)](#) advocate that the knowledge benefits of stakeholder engagement may make them an even more effective tool in public procurement than conventional competition aspects. Indeed, both competition and collaboration can be required. The transition to a more circular economy includes both of these aspects as actors collect and disseminate information along the supply chain, and seek to “influence the performance of supply chain members” ([Preuss, 2009](#), p. 215). Collaboration enables more horizontal rather than hierarchical structures, facilitating “knowledge competence and teamwork” ([Dietrich et al. 2010](#), p. 68).

Aspects of collaboration which may affect participation and hinder projects must be considered in intermediation. For example, collaboration may not affect cost reduction or operational performance ([Hollos, 2012](#)), and firms may also capitalize upon collaborative initiatives to preserve or enhance their organization’s interests ([Sharma & Kearins, 2011](#)) or as a platform to promote them through legitimacy instilled ([Fadееva, 2005](#)). The propensity for organizations to be engaged to further their own agendas should be considered especially when industry collaborates with government ([Lundvall, 1992](#)) – an important consideration when examined in the context of public procurement. Supplier opportunism can be reduced by selecting the right suppliers before collaboration occurs and by creating environments that reward desired behaviors to motivate supplier performance ([Eriksson & Pesamaa, 2013](#); [Gadde & Snehota, 2000](#)). As partnership goals in public procurement can be separated from project goals ([Lawther, 2005](#)), and potential for learning, innovations and collaboration from project

success ([Dietrich et al., 2010](#)), intermediation prior to procurement can be disentangled from the procurement itself to be studied as an important mechanism with the potential to influence business models. This is the approach taken by this paper.

3. Methods

This paper examines how intermediation can further the pre-procurement process and support a more circular economy. To do so, a qualitative case study method was applied using CCA, a method which consists of coding qualitative data for building theories grounded in empirical evidence ([Glaser & Strauss, 1967](#)). While case studies provide a snapshot in time rather than longitudinal data, rich details can emerge using such a method that provide deep insight into a unique case ([Yin, 1994](#)). CCA enables linking with previous research while supporting the development of broader implications ([Glaser & Strauss, 1967](#); [Strauss & Corbin, 1990](#)). In this paper, empirical data were collected through multiple interviews, transcribed and iteratively coded by using CCA.

Findings were then reported according to constructs that emerged from this process. The following subsections present the case selection, and further detail methods for data collection and analysis.

3.1. Case Selection

Reducing environmental impacts of textile production through recycling supports a more circular economy. Conventional textile production creates significant environmental impact, especially for cotton, with high life cycle impacts across categories of energy and water use, greenhouse gases, waste water production, and direct land use ([EC, 2011](#)). Governments across Europe are recognizing their responsibilities to reduce the environmental footprint of their textile purchases, including by decreasing the quantity of new material purchased. Taking a category-based approach, the Dutch government has introduced sustainability aspirations requiring workwear textiles to be completely repurposed by 2020, with long-term goals to support circularity in private markets ([Saltzmann, 2015](#)). Toward these goals, the Defence Materials Organization (DMO) of the Dutch Ministry of Defence (MOD) has incorporated clothing return and re-use, which has resulted in €12 million savings of their annual €35 million clothing budget ([Saltzmann, 2015](#)). The DMO saw that recycling materials within this system to make new clothing could further reduce the absolute volume of virgin cotton required, while creating opportunities to generate new revenue streams.

The pilot project examined in this paper was done to demonstrate the feasibility of purchasing textiles with post-consumer recycled content. It was part of the *Chain Approach* initiative under the *Waste Policy* program of the Ministry of Infrastructure and Environment (formerly the Ministry of Housing, Spatial Planning and the Environment; VROM), in collaboration with the industry association Modint and Rijkswaterstaat (RWS; formerly Agentschap NL). It was also part of REBus (Resource Efficient Business models), a €3.1 million European demonstration project (2013-16). The textile sector was one of the seven material chains examined in the *Waste Policy* program, under which two pilot projects were created: One focusing on the procurement of products containing recycled material from post-consumer material, and one for the optimization of DMO’s take back system of clothing at their Clothing and Personal Equipment Enterprise (Kleding- en Persoonsgebonden Uitrustings Bedrijf; KPU). The former pilot is the focus of this paper.

In the pilot, six intermediaries were identified post-interview, via coding and analysis activities: two “soft intermediaries” working with industry and markets, two “hard intermediaries” as subject-matter technical experts, and two “systemic intermediaries” from public agencies who were in leadership positions within the project. The latter were key intermediaries who helped to determine technical and market feasibility by interacting with potential suppliers, other intermediaries and actors, and each other. The purpose of their interactions was to inform a tender call rewarding post-consumer recycled content in

textiles that also met minimum technical specifications. The pilot was a success in this regard, as it resulted in such a tender call for more than €1 million for textiles with post-consumer recycled content at the DMO with the following characteristics. The products consisted of polo shirts and aprons with each 10% post-consumer recycled cotton and laces with recycled polyester, all delivered in packaging with minimum 75% (for plastic) or 80% (for cardboard) recycled material. CO₂, energy, and water savings were also demonstrated for the different products, and communicated in various ways. User acceptance was no issue, as care was taken to ensure that the products remained high-quality and functionally equivalent to any without (post-consumer) content which they replaced.

Regarding return flows, social benefits were seen in the employment of 80 FTEs (and often those with a distance to the labour market) for clothes sorting in the return flow, where one-third of the stock would be returned new in packaging, reducing needless waste. Regarding output flows, approximately 160 pallet boxes were offered to the market, as whole articles and cut clothing, every two weeks. This performance supports that the project had a positive impact on “closing the loop” for a more circular economy, with some additional social benefits.

Additional sustainability benefits included capturing knowledge-spillovers by co-writing a new terminology standard for recycled textiles (NTA 8195¹) in order to increase its percentage in clothing, collaboration between buyer and seller consortium to demonstrate recycled content, and with external institutions like Wageningen University on a solution to remove logo printing from clothing to improve recyclability. This engagement demonstrates continued collaboration between buyer and seller, and the joint formulation of “more circular” (future) requirements or technical possibilities.

The legal framework applied for the procurement was the European Directive 2014/24/EU, rather than EU Defence and Security Procurement Directive 2009/81/EC. This set higher requirements for factors including market competition than would the latter directive, such as ensuring that at least supplies could meet the criteria set. Notably, respondents indicated that this posed no legal barriers to the success of the project, which were rather found within the public organizations themselves and in the pace of the market.

3.2. Data Collection

For this study, data were collected from interviews as well as evidence in official publications and reports, including the Workwear Category Plan (Saltzmann, 2015), a workshop report (Bruls, 2015), request for information, tender call, official questions and answers (DMO, 2015), and relevant policy documents (e.g., IenM, 2014).

Eighteen semi-structured interviews were conducted for this study. In part due to it being an innovative pilot project, the project which the case study examined consisted of a small number of core participants during the planning phase, the vast majority of whom were interviewed. Participants were 1) government employees involved in the pilot project; 2) consultants, a national textiles sector consortium, and a NGO invited by government to contribute to the pilot; and 3) firms who participated in activities under the pilot project during the planning phase – namely, the workshops, request for information (RFI), or working group. To identify interviewees, government employees involved in the project were shared by contacts at the Dutch Ministry of Internal Affairs, as were representatives of the NGO and industry consortium. Industry contacts were identified through responses to the Request for Information posted electronically in October 2014.

To all potential respondents, official requests for interviews were sent individually via email, with a brief follow-up email one week after if

¹ NTA 8195 describes categories of circular textile products. This document sets requirements for the input flows and the applied circular strategies to be able to report on categories of circular products (NEN, 2020).

no response was received. The interviews took place beginning in Fall 2015, when the call for tender was published at the European level. Interviews occurred primarily in person, with a few over the phone due to distance restrictions. All interviews with non-governmental employees were completed first, so that no internal information could be unintentionally shared with external parties during the tendering phase. Respondent names were anonymized to encourage greater openness in responses, and all interviewees approved of their contributions to Sections 3.2, 3.3, and 4. Intermediaries then reviewed the findings as presented in Section 4 to ensure accuracy and completeness.

Using a semi-structured interview, questions were open-ended to solicit a multiplicity of responses from respondents. As part of this method (Campbell et al., 2013), sub-questions were asked depending on the depth and content of interviewee response. The questions helped to capture aspects of interactions, including their nature and frequency, drivers for change, barriers to change, facilitators, and suggestions for improvement. Interviews lasted an average of ninety minutes, totaling more than 25 hours of interviews.

3.3. Data Analysis

Data were coded and analysis was done using constant comparative analysis. The initial set of codes was created from concepts in the following literature, organized by subject (Table 1).

Once responses were transcribed, they were coded on these constructs using the software NVivo 11. Examples of key first order codes are shown in the left column of Figure 1, below. Codes were also created to identify project stages (right column, Figure 1), according to when and where interactions took place. New constructs were created when none from literature were suitable. When all interviews had been coded initially, the codes were reviewed based on their prominence within and across interviews. Nodes that were small were either combined within larger nodes, or created as a subset for finer granulation. On the other hand, large nodes were re-examined and broken down where appropriate. Following this, all nodes were reviewed systematically and iteratively using matrices to ensure that codes were consistently applied, particularly where codes were expected to overlap, and modified accordingly. While a number of constructs in the literature were found in the data, constructs that were unique from those in literature also emerged. These are summarized as second order codes and aggregate dimensions, presented in Figure 1 (below).

4. Findings

The findings summarized in Figure 1 are presented in the following section according to aggregate dimensions as headings, and second order codes as sub-headings. Throughout the analysis, intermediaries

Table 1
Key themes and literature used to form first order codes

Intermediary Roles	
Key Themes	Literature
Intermediary roles	van Lente et al., 2003
Intermediary functions	Howells, 2006
Intermediation in technology (innovation) purchasing	Bessant & Rush, 1995
Dynamics of Intermediation (Interactions)	
Key Themes	Literature
Antecedents, benefits, and factors influencing mediation in collaboration	Dietrich et al., 2010
Requirements for joint action between buyers and sellers	Eriksson & Pesamaa, 2013
Quality of interactions	Dietrich et al., 2010
Extent/degree of collaboration	Hartman et al., 1999
Particular disincentives or detriments to collaborate	Fadeeva, 2005; Gadde & Snehota, 2000; Hollos, 2012; Maspons, 2015; Sharma & Kearins, 2011

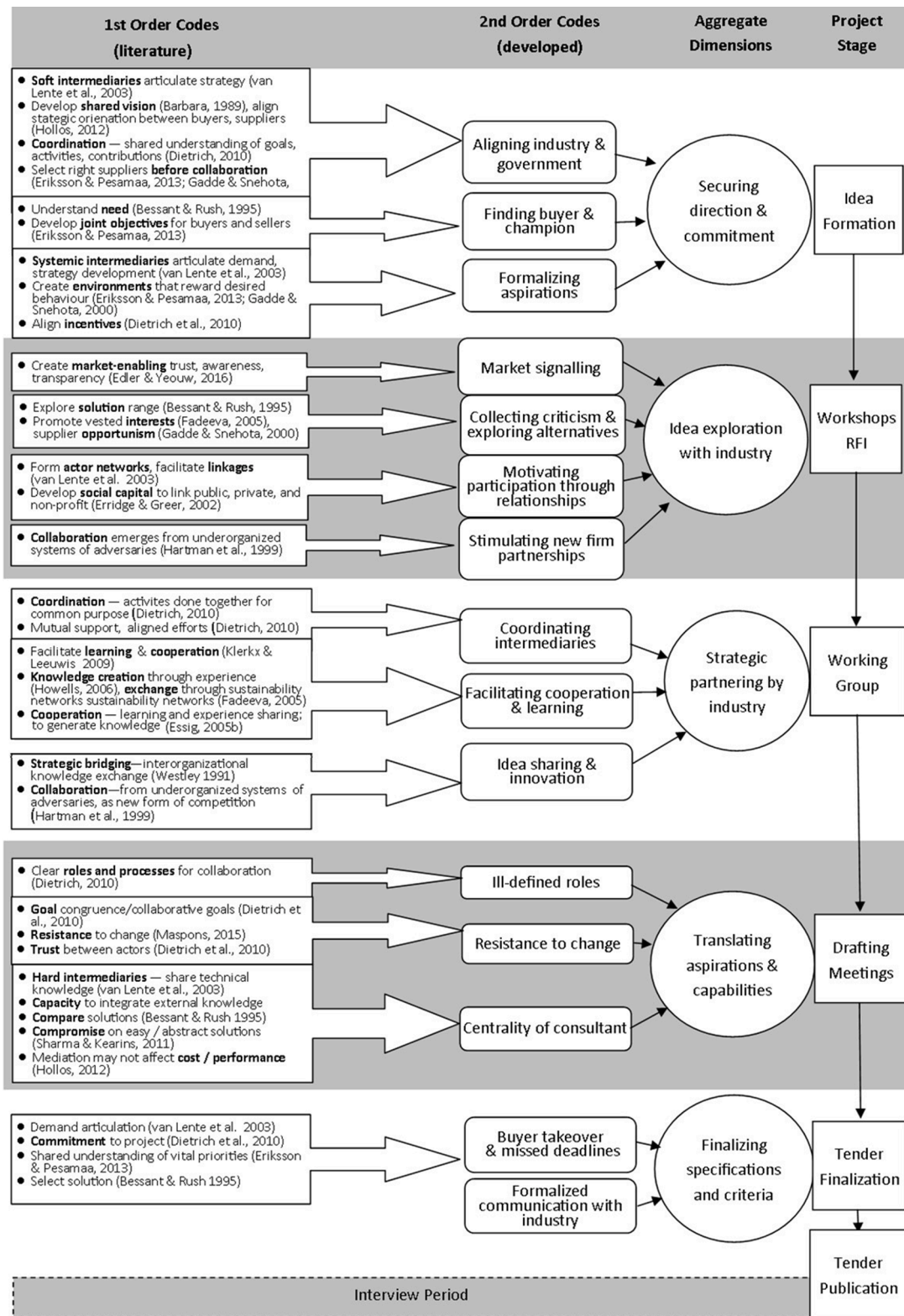


Figure 1. Summary of key codes from literature (first order codes), secondary codes developed using constant comparative analysis, and aggregate dimensions. These are presented according to project stages.

are underlined at key points.

4.1. Securing Direction and Commitment

4.1.1. Aligning industry & government

The Ministry of Infrastructure and Environment, the Industry Association and RWS created the pilot in 2013. After the project’s inception,

CSR Netherlands first developed an action plan for a sustainable fashion and textiles sector. The realization of the plan started in 2014 under the programme management of CSR Netherlands by working groups on several issues including the Working Group Circular Economy. During these activities, two intermediaries emerged, as identified during the coding and analysis portion of the current research: a prominent CSR Advisor from RWS, and CSR Netherlands.

Industry was involved in shaping the pilot project under the *Chain Approach* through the national Industry Association and CSR Netherlands. The Industry Association was a central member of the pilot project, with a vision to bring all member firms to higher sustainability performance through self-regulation. An Open Innovation Center for high-end textile recycling was also invited to help define the project. Their main goal was “to build consortia with partners to make developments go faster”. The Industry Association had a long-term reciprocal relationship with the Open Innovation Center regarding assistance with the pilot, as well as other projects toward circularity goals, and stated that their sustainability ambitions “fully fit” within one another. These partners became involved due to what they saw as inadequacies of public demand-setting in promoting circular economy for textiles, to “challenge the Ministry.” The Industry Association expressed unhappiness with the formulation of previous criteria in tender calls, viewing them as:

“Too broad in range in issues, and too strict on the criteria for each issue, so you get competition between different aspects....and never know in advance what the specific aspect [to be rewarded] is.”

4.1.2. Finding a buyer and champion

In early 2014, the Contract Manager of the DMO, under the MOD, agreed to serve as the buyer for the pilot project at their Clothing- and Personal Equipment Enterprise (KPU), during a meeting with seventeen other customers of the Workwear Category. They were convinced by the intermediary who would in 2015 become the Category Manager for Workwear, assigned to the Ministry of Internal Affairs. Under the new centralized purchasing system for national government agencies, the Workwear Category was created in 2015 as a team that included the Category Manager, the Contracts Manager and a Material System Specialist. Per their purchasing calendar, the Workwear Category would contact clients such as the MOD, who provided them with information on upcoming needs. In turn, the Category provided information on technical possibilities and markets, trying to “inch the needs of others into [their] own since there is a huge overlap and [the Category’s] specifications are usually the most complete.”

As did the Industry Association, the Contract Manager at the MOD also acknowledged challenges facing the use of public procurement in changing markets, stating that “people usually perceive a tender as a lottery because it takes so much time and effort and only one can win.” To help rectify these issues, a central goal of the project became to open the process of information sourcing for tender development to industry, to increase transparency, specificity, and opportunities for fair competition. With respect to the buyer, the role of the Category Manager was to “personally motivate” and stimulate the buyer, since the buyer did not have the “market mentality” and did not fully see the benefit of moving toward a more circular economy. The Category Manager stated the following:

“At this time, the most important factor of procurement is the price and my vision - one of the visions that I have - is that the sustainability is more important than the price, and also it’s my role to be a good example for the market and to create more enthusiasm.”

4.1.3. Formalizing aspirations

Following the commitment of the buyer, the Workwear Category combined their sustainability vision with the logistics requirements of

the buyer to develop its Category Plan Workwear in April 2015 (Saltzman, 2015). The Category Manager invited the CSR Advisor to jointly author the document, which served two purposes: supporting operational planning (logistics) for its clients, and communicating purchasing plans to the market. Together, they developed a vision to use the pilot as a stepping stone for a later pilot for creating additional revenue streams in the future for the MOD, when textiles could be recycled and purchased once again. The signing of this document by the Category Manager authorized his responsibilities, and communication of the plan two years prior to tendering was intended to help companies reconsider their investment plans and calculate profit timelines in preparation for the tender. As the final step in the first stage, the Category Plan published joint objectives between the buyer and potential suppliers of the pilot that had been created through earlier discussions between government, industry, and NGO groups.

4.2. Idea Exploration with Industry

4.2.1. Market signalling

After the pilot project goals were formalized and commitment secured, intermediaries shared the pilot aspirations with the market and gathered ideas. Both aspects were central to the implementation of the Category Plan, stated as “transparency about the vision and objectives” alongside “collaboration with interested market parties” (Saltzman, 2015, p. 4). The Category Manager did not see it as sufficient to only inform the market about their vision, as doing so would result in them asking for business, which had to be offered in the form of public demand. A key feature of signalling was that it was intended to give suppliers ample time to prepare. One respondent saw the Category Manager as successful in this regard, by opening up tenders which are usually “a secret” by “inviting everyone.... Making it more open and transparent, [and] then leaving it up to producers and manufacturers to do it.”

4.2.2. Collecting criticism and exploring alternatives

Together with the CSR Advisor and Industry Association, the Category Manager facilitated two supplier workshops in 2014: one to generate ideas for logistics and planning for the buyer, and the next to gather information regarding the feasibility and cost-effectiveness of including recycled content in products. These were attended by “every workwear producer,” with approximately forty participants whose interest was piqued by the size of the Category Manager’s purchases. Workshop leaders collected information on the current state-of-the-art, possibilities, and barriers regarding the ability to provide different degrees of recyclable content in textiles (Bruls, 2015). Later that year, the DMO sought the same information by publishing an electronic Request for Information on the electronic procurement platform TenderNED (DMO, 2014), and requested that the Industry Association send invitations for participation for both, to ensure fairness through a wide reach.

A key complaint heard by firms in these workshops was that prior to the pilot, the government communicated the desire to become greener, and then circular, but had continued to only look at prices in tendering instead of acting and setting an example. This had been identified earlier by the Category Manager and was central to developing his vision for the pilot project. Discussing technical possibilities, participants took issue with the sustainability losses of focusing on recycled cotton instead of polyester, questioned the validity of microscopic testing methods and the ability to conduct product controls, and were against the lack of transparency required and the potential to “cheat” through alternative sourcing or sub-contracting of recycled materials that would reduce prices. Alternative methods to tender the recycled material directly and then conduct a second tender for its manufacturing were suggested by one firm. In contrast, another firm believed that the co-creation process (used in the subsequent working group stage) was necessary for circular business models needed to win the tender, and that these could improve tracking and tracing along the value chain.

4.2.3. *Motivating participation through relationships*

During these workshops, and to a lesser extent during the subsequent working group stage, respondents believed the Category Manager acted as a “system-” or “macro-level” player who promoted the project by “kneading” and convincing audiences, and spreading enthusiasm. This coincided with the stated vision of the Category Manager. In addition to the workshops, firms who had existing contacts with the MOD often preferred to use these relationships as a means to solicit information. On such firm viewed the Category Manager as a middleman who was better equipped to deal with salespeople and could not fully appreciate new information on technical innovations that the firm had to offer. They believed that approaching technical specialists with the Category or the buyer was the best way to understand user needs and promote new advancements. Another firm preferred to bring innovative ideas directly to the MOD. In fact, for similar reasons, many firms were keen to develop relationships with the MOD to achieve better access to their competitors; they had a long-term perspective, and recognized fluctuations in purchaser priorities over time based on relationships with previous suppliers, international events, and policy shifts. Firms interviewed ranged from proactive firms leading the market and looking for cost reduction benefits of circularity, or those struggling for market survival – their participation in the pilot at this stage was to understand and influence future ambitions affecting a major buyer. They were curious about the project and its outcomes, and many were motivated by personal beliefs and a stated sense of responsibility for sustainability.

4.2.4. *Stimulating new firm partnerships*

Stimulating new partnerships along supply chains in the textile sector was a central goal of the pilot project, as necessary for a circular economy. All respondents interested in applying for the tender sought new partners. The Open Innovation Center itself developed and led a Dutch-Belgium consortium of companies, in which one member described them as “the glue between everyone saying things are possible.” One firm described new business relationships stimulated by the pilot as “the worst type of networking that you can have, since you are not sure that you will get [the tender], but you need to have the partners.” This networking represented investment into transitions by identifying what one respondent referred to as the “right players, solutions, and innovations,” which another respondent said could be catalyzed only by initial public funds, given the state of the market and technology at the time of the pilot project.

4.3. *Strategic Partnering by Industry*

4.3.1. *Coordinating intermediaries and facilitating cooperation*

The Industry Association invited interested industry members to participate in more frequent, in-depth, and technical discussions jointly chaired and facilitated by intermediaries. The forum for these interactions was the bimonthly Circularity Working Group hosted at CSR Netherlands, formed under the Industry Association’s National Action Plan. Meetings were jointly directed by the Sector Manager Textiles at CSR Netherlands, the CSR Advisor from RWS and the Category Manager. These actors took turns being the core facilitator of the meetings, along with the Open Innovation Center. While interested firms had already begun cooperating with new partners outside of official project activities, these working group interactions marked the first cooperation in the project between intermediaries and potential suppliers.

4.3.2. *Idea sharing and innovation*

Moving beyond the “sales pitches” given during the idea exploration stage, working group members exchanged more technical information about innovation possibilities and opportunities. Firms who were involved in the Circularity Working Group saw benefits in the sharing of such information – as stated by one firm:

“It is just building up your knowledge about the whole team, and that is what we are learning in the groups. It is a network with different companies, and is also an information gathering place.”

Upon this platform, ideas and knowledge were shared within a more informal context. Firms learned from each other and could “add up their knowledge in the new product” that to be specified in the tender call. The Category Manager valued the opportunity to use this working group to speak informally, which was “normally not possible.” Suppliers and often intermediaries preferred such informal discussions, where they could gather more concrete information about performance demands for which they could specify/develop technical solutions. The discussions during the working group helped firms involved to develop more innovative solutions to respond to the tender once it was published. One firm saw it as a “responsibility” to demonstrate that what they claim is possible can be done, and:

“...if not then why not, so that if the fabric will not pass the test, then at least I can say to the military and to the working group that look, I tried and that the test requirements are too high.”

Participants appreciated the working group interactions for how they overcame barriers from talking without acting, which was said to have high time costs and low benefit – and be a futile exercise when no investment is available. While the potential prize was high, no single firm participating was guaranteed to win it, leading to other firms stating that if they did not win they would not partake so heavily in future initiatives due to the resources required to explore R&D required and new partnerships. On behalf of the government, the effort put into the pilot showed a “practice what you preach” mentality, “set an example,” and manifested “real things” when implementing circularity within the government’s operational management. If the market wasn’t prepared yet, the Category Manager intended to repeat the pilot in the next contracting phase – likely unaware of firms’ threats to not cooperate in the future.

4.4. *Translating Aspirations and Capabilities*

Information generated during the pilot was translated into a draft tender during four meetings, which were chaired by an External Consultant hired by the Category Manager, and attended by the CSR Advisor, Category Manager, and Material System Specialist for the Category, as well as actors internal to the MOD – including the buyer and a Subsystems Specialist. The External Consultant hired an Advisor from the Open Innovation Center to help develop requirements, sampling provision, timelines, and evaluation. The Category Manager was also invited to modify the purchasing team at the buyer’s organization that would oversee the tender, and added a new Technical Specialist, choosing to keep the rest of the team the same for the sake of continuity. While the buyer advised for more emphasis on user needs rather than sustainability, intermediaries were challenged with convincing them of sustainability benefits despite an inability to develop a sound business case for recycled content.

4.4.1. *Ill-defined roles*

Once industry consultation had taken place, the buyer became responsible for drafting the tender. Unlike the Category’s other clients – for whom the Category acted themselves as the buyer – the buyer maintained a procurement team of nine employees that specialized in purchasing articles of higher importance for Defence capabilities. In previous procurements, the role of the Category had made it difficult to intermediate between suppliers and buyers when user requests were not clearly communicated by account managers. This pilot was more simplified, as it purposefully chose low-risk and non-complex articles to support project success. The problems which arose instead pertained to a failure to clearly designate roles and responsibilities. With the initial impression that the external intermediaries would design the tender, it

was not until after the third of four such meetings that the buyer's procurement team understood that they were the ones who would have to do so. This confusion was reflected by the Category Manager's statement that the buyer's organization had difficulties understanding his role, calling himself "only a guest in this house." Most significantly, the roles of the Category (Manager) and the External Consultant during these meetings were not well defined, which caused some confusion regarding the transfer of information. As an "outsider," the Category Manager experienced success in organizing meetings at earlier stages of the project, "until the moment it was a formal procurement."

4.4.2. Resistance to change

Despite the MOD's initial agreement to serve as buyer for the project, when it came time to translate the findings into tender specifications, intermediaries were met with resistance. The Category was tasked with convincing their customers of the benefits of, and providing training for, "greening" their procurement, which was difficult when advocating for unproven innovations and markets:

"You have to convince your customer that he wants something else, but there's no intrinsic need for the customer to be more green or more aware.... It's just so unpredictable at the moment that I can't really give them the advantages; it is hard for a customer to see the advantage of what they're buying."

Both the Category and the procurement team were careful to respect competition rules, to the point that one respondent viewed the buyer as "following the rules but not more" such as the sustainability aspirations envisioned in the Category Plan.

4.4.3. Centrality of consultant

The External Consultant was included in a fourth meeting together with the buyer and their procurement team, and helped to compare potential solutions. In drafting the tender specifications, the functional requirements and limitations began to take priority over recycled content, as the procurement team believed external actors were not as familiar with their markets and users. Two participants interviewed perceived this resistance to change due to historical precedence and numerous authorizations required by organizational hierarchies. Based on its value alone, the procurement would already require review and authorization at a higher level once a supplier was chosen. Adding sustainability criteria created extra burden for the tender writers.

As part of their role, the External Consultant assisted the other intermediaries in advocating for proportionately rewarding higher amounts of recycled cotton content in award criteria and changing the colour of the textiles – modifications which were perceived by actors internal to the buyer organization as possible for "regular users" but not feasible for products for military purposes. The External Consultant pushed for performance-based standards, developed through a systemic understanding of the functional requirements of the textiles. The resulting specification after several discussions was "a kind of compromise," seen from the buyer's perspective as underpinned by the tendering strategy to maintain high quality by maintaining certain requirements.

4.5. Finalizing Specifications and Criteria

Towards tender publication, the involvement of intermediaries ceased, as the procurement team finalized the tender to finally articulate demand. The buyer became responsible for the project and for communication with industry, which was then formalized. At this point, the process was undertaken according to standard procurement procedures. Finally, once the tender was published, it was the role of the buyer to select a solution.

4.5.1. Missed deadlines

Despite the visibility of the Category Manager's message and the "huge impact and priority the pilot should have had," delays in internal staffing and the delayed publishing of the tender proved to be problematic. The internal change from the restructuring of purchases into categories that occurred during the pilot created staffing delays for both the Category and the buyer, which played a role in missed deadlines. Both a supplier and the Contract Manager saw that staffing changes and outsourcing knowledge to the market had led to what the latter described as a "huge drain of information in the departments themselves," where it was difficult to get information from the government when it was held by their supplier. In part, this drove the earlier stages of market consultation. Including for the Category Manager, who appeared to be spearheading the project, the time dedicated to the pilot (including associated workshops and the working group) was relatively low and was not the primary role of any one respondent. Prioritization of procurements from the MOD – which were admittedly "more important than a couple of towels" – also pushed back deadlines. To quote one respondent: "Deadline after deadline was skipped because of this and that." The Category Manager had no authority to prioritize the pilot project within the KPU, but could only stimulate progress through personal motivation. Once the tender was initially published, the keywords did not include those used throughout the earlier project stages that the industry was expecting, such as "workwear, corporate clothing, or uniform" that one firm relied on their search alert to pick up. The Category Manager was blamed by the firm for this, when publishing responsibilities were those of the buyer. The formal complaints lodged by this supplier likely led to the extension of the tender deadline by another month.

The pilot "created a lot of change" amongst a new backdrop of reorganized institutional purchasing structures. In the face of this reorganization, the Category proceeded carefully while inducing sustainability pressures, focusing foremost on continuity to increase the buyer's trust.

5. Discussion

Intermediation during the pilot contributed to a more circular economy by motivating and enabling key actors to create new connections and exchange knowledge, which furthered systemic learning across project stages. Demonstrated outputs – both qualitative and quantitative – were also created, as presented in [Section 3.1](#). Enabling factors were the abilities of *multiple* intermediaries to conduct complementary activities, obtain the private sector's interest and commitment, stimulate new market relationships, support the transfer of market/technology aspirations and capabilities to the buyer, and improve their translation into an official tender call. Project inertia and resistance to change emerged in the final project stages as gathered information became increasingly codified.

Consisting of both individuals and organizations, intermediaries coordinated activities, facilitated cooperation with and amongst firms, and collaborated with the buyer especially. Their actions stimulated knowledge generation, sharing, and learning, which they then used to support demand articulation by the buyer. As such, the pilot was itself an exercise in *demand articulation*, which intermediaries contributed to via *actor linkage formation* and *innovation process management* (or, process innovation management), in contrast to the distinction of these three types of intermediation by [van Lente et al. \(2003\)](#). Fluidity of network structures ([Clarke & Roome, 1999](#)) was found in overlapping networks, movement of intermediaries between them, and by their evolving roles over time.

In contrast to the case examined by [Edler and Yeow \(2016\)](#) where internal change was an *outcome* of introducing intermediation in procurement, this paper identified challenges facing intermediation that were *caused by* internal change – which was, ironically, intended to increase efficiency. Within this dynamic environment, the pilot provided

different *platforms* upon which where knowledge was collected and shared by multiple parties, according to the project stage. The degree of formalization of these platforms was a critical aspect to the interactions that happened upon them, and findings reinforce the following three phases of project-level change applied by Grandia (2015) in change agents for sustainable procurement. Aligning with the *mobilizing* phase, the project became most open to informal interactions during the working group stage, where collaboration occurred with select market participants regarding developing new ideas for potential solutions. This also suggests systemic effects of intermediation, in which intermediaries can also have a more indirect influence by playing “enabling and supporting roles” (Edler & Yeow, 2016, p. 416), such as in stimulating firms toward new partnerships, in addition to linking actors and facilitating their interactions.

During the initial and final stages, information became codified – during Idea Formation, in the form of aspirations in the Category Plan, and during Tender Finalization, in the form of the official tender call. The former aligns with *unfreezing* phase, including vision development and planning, and the latter with *freezing* phase including refinement and institutionalization. Importantly, the findings of this study add depth to these phases by highlighting the activities of different actors according to platforms. Early interactions, within the unfreezing phase, were marked by joint activities and industry representatives, whereas those in the mobilization phases were between the buyer and (potential) suppliers. In the freezing stage, the buyer finalized demand that compromised between these sustainability aspirations and their own interests in price and quality.

While activities at a general level corresponded with previous definitions according to formalization, the findings suggest that there is a need to reconceptualise roles for intermediation in this process. The findings both support and challenge roles for intermediation defined by Edler and Yeow (2016) (*performer, broker, content expert, and trainer*),² based upon distinctions including by van Lente et al. (2003) (*hard, soft, and systemic*). While intermediaries did not serve as a *performer* of procurement, they performed certain functions associated with the purchase, including project management, while taking ownership of the project during the middle stages. Systemic intermediaries (namely, the *CSR Advisor* and *Category Manager*) functioned as information *brokers*, performing brokering activities with external market actors (searching for solutions and potential providers, signalling suppliers) and internal government employees (need definition and translation into the tender). The abilities of systemic intermediaries to personally motivate markets and government actors alike contributed to this brokering activity.

Roles for intermediaries as *content experts* (Edler & Yeow, 2016) were identified in this study, and differentiated according to soft intermediaries (*Industry Association* and *CSR Netherlands*) and hard intermediaries (*Open Innovation Center* and the *External Consultant*) (van Lente et al., 2003). While Edler and Yeow (2016) couple technology expertise and market knowledge within the same role, this study identified that capabilities of intermediaries were specialized in one or the other, although there was some crossover of expertise as hard intermediaries were also involved in idea formation, and soft intermediaries in drafting meetings. Importantly, intermediaries did not have any role as *trainers* (Edler & Yeow, 2016), but rather as *knowledge transfer agents*. This is particularly relevant to the *Category Manager* systemic intermediary, who was skilled in knowledge transfer rather than being a content expert. Recently, many responsibilities and capabilities had been shifted to the Category Managers and from the buyers.

² It should be noted that, while Edler and Yeow (2016) distinguished two cases by triggering an innovation, or responding to an innovation already in the marketplace, the case study examined in this paper had features of both of these purchase types, as the pilot was intended to create a larger market to help the market for incorporating recycled material scale up. As such, their findings according to both of these cases were drawn upon for comparison purposes.

In this context, intermediaries translated product and market knowledge (but not capabilities) to the buyer. Buyer resistance during the Drafting stage may have been influenced by this new structure of responsibilities.

With respect to project phases, soft and hard intermediaries were most active in the initial and second-last stages (see Table 2, above), respectively; the unique contribution of the systemic intermediaries was during the idea exploration and strategic partnering activities during the workshop and working group stages. Systemic intermediation played a critical role in translating *market* information (from communication with sales people on innovation and markets) and *technical* information (from working group discussions) into tender specifications with the help of specialists (hard and soft intermediaries). The systemic intermediary was seen as a market interface, and the figurehead of the project during its execution stages. His reliance on personal motivation perhaps compensated for a lack of authority to further the project, once the buyer assumed leadership in the last stage, “Finalizing specifications & criteria”. This was done to help ensure neutrality of the final tender; further, it was also communicated that their assistance would not be helpful at this point, as they were neither a subject matter expert nor tasked with developing tenders in their organization.

Dynamics of intermediation were in differing involvement of actors, platform exclusivity, and content exchanged throughout the course of the project. Due to this, coordination, cooperation, and collaboration were performed at different stages and with facilitation by different intermediaries. Collaboration provided strategic bridges enabling the exchange of knowledge between organizations, towards solving problems that no party could address unilaterally (Westley & Vredenburg, 1991). Support was found for the importance of both collaboration and competition as actors – including potential suppliers, systemic intermediaries, and the buyer – “challenged each other all the time” while searching for ways to “interconnect and work together” to shape the demand toward their own goal. These activities were driven by different objectives of participating firms, of the buyer (to maintain quality and reasonable pricing), and the intermediaries (to increase the content of post-consumer recycled material).

6. Conclusions

This paper provides an exploratory approach to understanding *in what ways the roles and dynamics of intermediation promote a more circular economy through public procurement*, focusing on the pre-procurement (planning) phase. It begins by drawing upon literature highlighting intermediary roles in projects, as well as that detailing interactions by intermediaries. A qualitative case study is developed to examine intermediation in extensive consultation activities in a national public procurement pilot project. Eighteen interviews are conducted with individuals involved in these activities, including from government, industry, and an NGO. Using constant comparative analysis, literature is applied to the findings as first-order codes, building second order codes and finally aggregate dimensions which capture intermediary activities according to project stages. Six intermediaries are identified and differentiated by their activities related to markets (soft intermediaries), technical expertise (hard intermediaries), and project management (systemic intermediaries).

These intermediaries were found to play a critical role by 1) coordinating government and industry through aligning project goals, 2) facilitating cooperation of industry players to stimulate new business relationships, and 3) collaborating with the buyer to push for higher post-consumer recycled material in the final tender. The coordination of multiple intermediaries facilitated often unilateral action toward a common goal. This increased the efficiency of their involvement while enabling for their complementary capabilities as soft, hard, or systemic expertise to be put to best use depending on the project stage, across which actors and degrees of formality varied.

This paper supports the use of intermediation to help accomplish public demand articulation through pre-procurement consultation.

Table 2

Areas of involvement according to aggregate dimensions, and intermediary classification by van Lente et al. (2003)

Intermediary	Securing direction & commitment	Idea exploration with industry	Strategic partnering by industry	Translating aspirations & capabilities	Finalizing specifications & criteria
Soft intermediaries					
Industry Association	✓	✓			
CSR Netherlands	✓		✓		
Hard Intermediaries					
Open Innovation Center	✓		✓		
External Consultant				✓	
Systemic Intermediaries					
CSR Advisor	✓	✓	✓	✓	
Category Manager	✓	✓	✓	✓	

Findings present evidence supporting the centrality of systemic intermediation in initiatives promoting a more circular economy, and provide a unique contribution to the understanding of intermediation dynamics in demand articulation. Future projects involving intermediation should consider the coordination of multiple intermediaries with specialized market or technical knowledge. To achieve commitment and willing collaboration by buyers, sustainability incentives must first be bundled with cost-savings. This may be especially true for public agencies, who are typically averse to higher risks posed by more innovative purchasing (Uyarra et al., 2014) and often lacking the knowledge and consultation necessary to design tender calls that meet their needs (Rainville, 2016b). This paper provides evidence that using intermediation can help mitigate these challenges in supporting public demand articulation. Doing so can make the public sector a first-mover, helping to solve the “chicken-or-the-egg” conundrum between buyers and suppliers holding back transitions to a more circular economy.

This study has certain limitations that create opportunities for further research. With respect to demand articulation, greater insight is needed to discover how to best combine buyers' motivations for cost savings, sellers' motivations of increased returns, and the sustainability requirements often imposed by third parties. These dynamics are expected to mark transitions toward a more circular economy as more projects arise, carving a more permanent role for intermediation in order to improve consultation processes and their outcomes. Although it does not compare between multiple cases, the case study method provides deep insight into the complexities of networked actors driven by different motives toward circularity transitions. Finally, in terms of causality and power dynamics or influence between supply- and demand-sides, the question arises of whether the intermediary is 1) indeed independent, and 2) not unduly swayed by either side, in understanding which factors contribute in what way – and how much – to the procurement outcome. Further research should be undertaken to tackle this question, also with respect to circular procurement.

Regarding the applicability of findings to regular procurement, intermediation in public procurement has unique features that differentiate it from buyer-supplier relationships in the market. While the former includes additional dimensions such as policy drivers, other non-public organizations can nevertheless draw upon roles and dynamics of intermediation to better structure consultation processes.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

This project was conducted with funding from the Climate KIC PhD Program and the Climate KIC Mobility Research Program. The author kindly thanks Rob van Arnhem and Aletta Westra at the Dutch Ministry

of Defence, and Emile Bruls, Joan Prummel, and Cuno van Geet at Rijkswaterstaat their assistance. As well, the author thanks the eighteen interviewees for providing their invaluable contributions toward this project. Earlier versions of this paper were presented after invitation at the KPU-Soesterberg Contract Signing - Milestone in CSR Target with Recycled Post-Consumer Textiles, June 15, 2016 in Amersfoort, the Netherlands, and the ETH Zurich PhD Academy on Sustainability and Technology 2016 in Appenzell, Switzerland.

References

- Bessant, J., Rush, H., 1995. Building bridges for innovation: the role of consultants in technology transfer. *Research Policy* 24 (1). [https://doi.org/10.1016/0048-7333\(93\)00751-E](https://doi.org/10.1016/0048-7333(93)00751-E), 97–111.
- Bruls, E., 2015. *Market Consultation Report May 15 KPU company Soesterberg*. Rijkswaterstaat, Utrecht, NL.
- Burt, R.S., 1992. The social structure of competition. In: a. R. G. Eccles, N.N. (Ed.), *Networks and Organizations: Structure, Form, and Action*. Harvard Business School Press, Boston, MA, pp. 57–91.
- Caldwell, R., 2003. Models of Change Agency: a Fourfold Classification. *British Journal of Management* 14 (2), 131–142. <https://doi.org/10.1111/1467-8551.00270>.
- Campbell, J., Quincy, C., Osseman, J., Pedersen, O., 2013. Coding In-depth Semistructured Interviews: Problems of Unitization and Inter-coder Reliability and Agreement. *Sociological Methods and Research* 42 (3), 294–320. <https://doi.org/10.1177/0049124113500475>.
- Clarke, S., Roome, N., 1999. Sustainable business: learning – action networks as organizational assets. *Business Strategy and the Environment* 8 (5), 296–310. [https://doi.org/10.1002/\(SICI\)1099-0836\(199909/10\)8:5<296::AID-BSE212>3.0.CO;2-N](https://doi.org/10.1002/(SICI)1099-0836(199909/10)8:5<296::AID-BSE212>3.0.CO;2-N).
- Dietrich, P., Eskerod, P., Dalcher, D., Sandhawalia, B., 2010. The dynamics of collaboration in multipartner projects. *Project Management Journal* 41 (4), 59–78. <https://doi.org/10.1002/pmj.20194>.
- DMO, 2014. *Toepassingsmogelijkheden van gerecyclede vezels (Request for Information)*. Referentienummer: RFI 2014/DKIV/001. Den Haag: Defensie Materieel Organisatie (DMO) van het Ministerie van Defensie.
- DMO, 2015. *Kennisgeving van aanvullende informatie, informatie over een onvolledige procedure of rectificatie: Pilot ROVK gerecyclede content in overalls en handelsartikelen*. TenderNed en TED: Ministerie van Defensie, Defensie Materieel Organisatie, KPU-bedrijf. TenderNed-kenmerk: 81342; Referentienummer: 87215114600. <https://www.tenderned.nl/tenderned-web/aankondiging/detail/samenvatting/akid/0a9d4c5b2f9d669945824f6f82d07e8a/pageId/D909D/huidigemenu/aankondigingen/cid/256082/cvp/join>.
- EC, 2011. *Green Public Procurement - Textiles - Technical Background Report for the European Commission – DG-Environment by BRE*. Brussels: European Commission, 2011. http://ec.europa.eu/environment/gpp/pdf/tbr/textiles_tbr.pdf.
- EC, 2014a. *Towards a Circular Economy: A Zero Waste Programme for Europe*. COM (2014). Brussels: European Commission, p. 398 final/2.
- Edler, J., Yeow, J., 2016. Connecting demand and supply: The role of intermediation in public procurement of innovation. *Research Policy* 45 (2), 414–426. <https://doi.org/10.1016/j.respol.2015.10.010>.
- Edquist, C., Zabala-Iturrigagoitia, J.M., 2012. Public Procurement for Innovation as mission-oriented innovation policy. *Research Policy* 41 (10), 1757–1769. <https://doi.org/10.1016/j.respol.2012.0022>.
- ERAC, 2015. *ERAC Opinion on Innovation Procurement*. European Research Area And Innovation Committee, Brussels. ERAC 1209/15.
- Eriksson, P.E., Pesamaa, O., 2013. Buyer-supplier integration in project-based industries. *Journal of Business & Industrial Marketing* 28 (1-2), 29–39. <https://doi.org/10.1108/08858621311285697>.
- Erridge, A., Greer, J., 2002. Partnerships and public procurement: building social capital through supply relations. *Public Administration* 80 (3), 503–522. <https://doi.org/10.1111/1467-9299.00315>.

- Essig, M., Batran, A., 2005. Public-private partnership - Development of long-term relationships in public procurement in Germany. *Journal of Purchasing and Supply Management* 11, 221–231.
- Fadeeva, Z., 2005. Promise of sustainability collaboration—potential fulfilled? *Journal of Cleaner Production* 13 (2). [https://doi.org/10.1016/S0959-6526\(03\)00125-2](https://doi.org/10.1016/S0959-6526(03)00125-2), 165–17.
- Gadde, L.-E., Snehota, I., 2000. Making the Most of Supplier Relationships. *Industrial Marketing Management* 29 (4), 305–316. [https://doi.org/10.1016/S0019-8501\(00\)00109-7](https://doi.org/10.1016/S0019-8501(00)00109-7).
- Geels, F., Deuten, J.J., 2006. Local and global dynamics in technological development: a socio-cognitive perspective on knowledge flows and lessons from reinforced concrete. *Science and Public Policy* 33 (4), 265–275. Retrieved from. <http://spp.oxfordjournals.org/content/33/4/265.abstract>.
- Grandia, J., 2015. The role of change agents in sustainable public procurement projects. *Public Money & Management* 35 (2), 119–126.
- Glaser, B., Strauss, A., 1967. *THE DISCOVERY OF GROUNDED THEORY STRATEGIES FOR QUALITATIVE RESEARCH*. CA Sociology Press, Mill Valley.
- Hargadon, A., Sutton, R.I., 1997. Technology Brokering and Innovation in a Product Development Firm. *Administrative Science Quarterly* 42 (4), 716–749. <https://doi.org/10.2307/2393655>.
- Hartman, C.L., Hofman, P.S., Stafford, E.R., 1999. Partnerships: A path to sustainability. *Business Strategy and the Environment* (8), 255–266. Retrieved from. http://www.researchgate.net/profile/Peter_Hofman/publication/232814940_Partnerships_A_path_to_sustainability/links/54dc2bc0cf23fe133b08037.pdf.
- Henderson, R., Cockburn, I., 1994. Measuring Competence? Exploring Firm Effects in Pharmaceutical Research. *Strategic Management Journal* 15 (S1), 63–68. <https://doi.org/10.1002/smj.4250150906>.
- Hollos, D.e.a., 2012. Does sustainable supplier co-operation affect performance? Examining implications for the triple bottom line. *International Journal of Production Research* 50 (11), 2968–2986. <https://doi.org/10.1080/00207543.2011.582184>.
- Howells, J., 2006. Intermediation and the role of intermediaries in innovation. *Research Policy* 35 (5), 715–728.
- IenM, 2014. *Van Afval Naar Grondstof - Uitwerking van acht operationele doelstellingen*. Den Haag: Ministerie van Infrastructuur en Milieu (IenM).
- Klerkx, L., Leeuwis, C., 2009. Establishment and embedding of innovation brokers at different innovation system levels: Insights from the Dutch agricultural sector. *Technological Forecasting and Social Change* 76 (6), 849–860. <https://doi.org/10.1016/j.techfore.2008.10.001>.
- Lawless, M.W., Price, L.L., 1992. An Agency Perspective on New Technology Champions. *Organization Science* 3 (3), 342–355. <https://doi.org/10.1287/orsc.3.3.342>.
- Lawther, W.M.L., 2005. Innovative practices in public procurement partnerships: The case of the United States. *Journal of Purchasing & Supply Management* 11, 212–220.
- Lundvall, B., 1992. *NATIONAL SYSTEMS OF INNOVATION: TOWARDS A THEORY OF INNOVATION AND INTERACTIVE LEARNING*. Pinter, London.
- Maspous, R., 2015. *The STOPandGO Public Procurement of Innovation (PPI) Experience*. Paper presented at the European Assistance for Innovation Procurement.
- Meulen, B.v.d., Rip, A., 1998. Mediation in the Dutch science system. *Research Policy* 27 (8), 57–769. [https://doi.org/10.1016/S0048-7333\(98\)00088-2](https://doi.org/10.1016/S0048-7333(98)00088-2).
- NEN, 2020. Circulair textiel - Eisen en categorieën. Retrieved 16 July 2020 from. <https://www.nen.nl/NEN-Shop/Norm/NTA-81952020-nl.htm>.
- Preuss, L., 2009. Addressing sustainable development through public procurement: the case of local government. *Supply Chain Management* 14 (3), 213–223. <https://doi.org/10.1108/13598540910954557>.
- Rainville, A., 2016a. Standards in green public procurement: A framework to enhance innovation. *Journal of Cleaner Production*. <https://doi.org/10.1016/j.jclepro.2016.10.088>.
- Rainville, A., 2016b. From whence the knowledge came: Heterogeneity of innovation procurement across Europe. *Journal of Public Procurement* 16 (4), 463–504.
- Rolfstam, M., 2012. An institutional approach to research on public procurement of innovation. *Innovation: The European Journal of Social Science Research* 25 (3), 303–321. <https://doi.org/10.1080/13511610.2012.717475>.
- Rolfstam, M., 2009. Public Procurement as an Innovation Policy Tool: the Role of Institutions. *Science and Public Policy* 36 (5), 349–360.
- Saltzman, H.J.M., 2015. *Category Plan Rijk Workwear - Information day for suppliers 23 April 2015*. Den Haag: Dutch Ministry of Defence (Ministerie van Defensie).
- Sharma, A., Kearins, K., 2011. Interorganizational Collaboration for Regional Sustainability - What Happens When Organizational Representatives Come Together? *The Journal of Applied Behavioral Science* 47 (2), 168–203.
- Strauss, A., Corbin, J.M., 1990. *BASICS OF QUALITATIVE RESEARCH: GROUNDED THEORY PROCEDURES AND TECHNIQUES*. Sage Publications, Inc.
- Testa, F., Iraldo, F., Frey, M., Daddi, T., 2012. What factors influence the uptake of GPP (green public procurement) practices? New evidence from an Italian survey. *Ecological Economics* 82 (0), 88–96. <https://doi.org/10.1016/j.ecolecon.2012.07.011>.
- Uyara, E., Edler, J., Garcia-Estevez, J., Georghiou, L., Yeow, J., 2014. Barriers to innovation through public procurement: A supplier perspective. *Technovation* 34 (10), 631–645. <https://doi.org/10.1016/j.technovation.2010003>.
- van Lente, H., Hekkert, M., Smits, R., van Waveren, B., 2003. Roles of Systemic Intermediaries in Transition Processes. *International Journal of Innovation Management* 7 (3), 247–279. <https://doi.org/10.1142/S1363919603000817>.
- Von Hippel, E., 1988. *THE SOURCES OF INNOVATION*. Oxford University Press, Oxford.
- Walker, H.P.L., 2008. Fostering sustainability through sourcing from small businesses: public sector perspectives. *Journal of Cleaner Production* 16 (5), 1600–1609.
- Westley, F., Vredenburg, H., 1991. Strategic Bridging: The Collaboration between Environmentalists and Business in the Marketing of Green Products. *The Journal of Applied Behavioral Science* 27 (1), 65–90. Retrieved from. <http://jab.sagepub.com/content/27/1/65.abstract>.
- Yin, R.K., 1994. *Case study research: Design and methods*, Second Edition, 5. Sage Publications, Thousand Oaks, CA.