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179

Mapping the research landscape of innovation intermediaries in public procurement: a review of reviews

Hendrik Hermann Bangert, Christian von Deimling and Michael Eßig

Procurement Research Group, Bundeswehr University Munich, Neubiberg, Germany

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Abstract

Purpose – This study aims to examine the current state of research on innovation intermediaries by analysing systematic literature reviews (SLRs), focusing specifically on the extent to which public procurement is considered.

Design/methodology/approach – This study uses a review of reviews methodology, with SLRs as the unit of analysis. This approach allows for a comprehensive synthesis of existing research on innovation intermediaries and a focused examination of public procurement within this literature.

Findings – The findings reveal that research predominantly focuses on private-sector dynamics, leaving public procurement underexplored. Barriers to public procurement of innovation (PPoI), such as inadequate supplier interaction, underscore the need for intermediaries, yet their role in overcoming these challenges is not thoroughly examined. This highlights the necessity for more targeted research on how innovation intermediaries can effectively support procurement processes in the public sector, particularly at the management level, to enhance PPoI outcomes.

Social implications – Public procurement is a strategic tool for achieving policy objectives. Leveraging innovation intermediaries as an instrument for implementation could significantly enhance the effectiveness of PPoI.

Originality/value – This study evaluates SLRs to assess the extent to which public procurement is addressed and identifies transferable insights to enhance the understanding of innovation intermediaries in a public procurement context. Building on these findings and an exploratory analysis of 90 identified innovation intermediaries in public procurement across the European Union, this study conceptualises how these organisations can support public procurement management in different procurement situations, particularly in contexts with high or low technology readiness levels.

Keywords Innovation, Intermediaries, Public, Procurement, Review

Paper type Literature review

1. Introduction

Stimulating innovation through public procurement of innovation (PPoI) (Obwegeser and Müller, 2018; Wesseling and Edquist, 2018) is a central topic in the ongoing public procurement research debate. This debate primarily focuses on the impact of public

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procurement on businesses, the economy and society, particularly in the context of supporting policy implementation and advancing broader governmental strategies (Glas *et al.*, 2017; Harland *et al.*, 2019; Telgen *et al.*, 2007). According to Mwesiumo *et al.* (2021), PPoI "occurs when public sector organizations serve as a launchcustomer for an innovative good, work or service". Supplier-driven innovations play a crucial role in transforming public sector operations by improving service delivery, efficiency and resilience while addressing broader societal challenges such as climate change, digital transformation and public health crises (Albury, 2005; Knutsson and Thomasson, 2014; Wesseling and Edquist, 2018). Estonia's e-government system exemplifies such an approach, having been developed in collaboration with technology providers to enable citizens to access nearly all public services online, including electronic voting (e-Estonia, 2024; Kalvet, 2012). Notably, a wide range of significant technologies have been initiated, advanced or supported through PPoI. Examples include the first widely influential personal computer, the Apple II (Jancer, 2016; Jobs, 1995; Lussenhop, 2011), as well as the internet and the Global Positioning System, both initiated by the U.S. Department of Defense (Herring, 1996; Mowery and Simcoe, 2002). As Lember *et al.* (2014) argued, PPoI "has an equally central, if not even bigger role to play in promoting incremental innovations where existing products are adapted to the local context […]".

The significance of public procurement lies in its substantial financial leverage, with public authorities in the European Union (EU) estimated to spend around 14% of the gross domestic product, or approximately EUR 2tn per year, on purchasing services, works and supplies (European Council of the European Union, 2020). Although only a portion of this spending, even when demonstrating innovation potential, is actually directed towards stimulating innovation (Krieger *et al.*, 2024), the potential remains substantial when compared to the EUR 219.2bn spent on research and development by the top 363 companies in Europe in 2022 (European Commission, 2023). Hence, policymakers are increasingly addressing innovation policy not only through traditional funding mechanisms but also by promoting a demand-driven approach to innovation policy: "Research and innovation, including eco-innovation and social innovation, are among the main drivers of future growth and […] public authorities should make the best strategic use of public procurement to spur innovation" (European Parliament, 2014, 2014/24/EU Recital 47). Though varying in extent and approach, such policies are evident in various countries, including the USA, UK, Korea, Greece, China and Brazil (Lember *et al.*, 2014).

However, despite the growing number of policies aimed at supporting public organisations to conduct PPoI, research indicates that the public sector struggles with *implementing* the policy suggestions (Lember *et al.*, 2015). Barriers to innovation in public procurement include intra-organisational barriers such as a short-term focus on efficiency and poor risk management (Lember *et al.*, 2015; Uyarra *et al.*, 2014). From the perspective of suppliers, there is a perceived lack of willingness within public sector organisations to engage with and consider information and ideas originating from the supply market (Georghiou *et al.*, 2014; Melander and Arvidsson, 2020; Uyarra *et al.*, 2014). These challenges underscore the critical need to specifically address procurement management within public organisations. One negative impact of these barriers is highlighted in a 2023 analysis by the European Court of Auditors, which reveals a significant decline in competition for public contracts in the EU over the past decade (European Court of Auditors, 2023). These factors suggest that public organisations need support in organisational and processual procurement factors influencing the capability to procure innovations from suppliers.

Innovation intermediaries are considered promising for supporting public contract award entities to catalyse PPoI. In its guidance on innovation procurement, the EU Commission describes innovation intermediaries as actors with the necessary capacity and interest to mediate between private sector suppliers offering innovative solutions and public sector contracting authorities with a need for an innovative solution (European Commission, 2021). According to the EU Commission, they do not only establish contact between suppliers and public clients but can also provide concrete support to public clients in the various phases of the procurement process (European Commission, 2020a, 2021). Innovation intermediaries exist as an empirical phenomenon, as evidenced by various efforts across EU member states to establish such entities (see section 4). This trend is evident in various regions. Duan and Jin (2022) noted that in statist countries such as Japan, China and South Korea, a top-down innovation model has been effective but reveals limitations in a knowledge economy, prompting the use of government-funded intermediaries to bolster regional innovation. Such approaches can also be identified in Chile (Klerkx *et al.*, 2015). Similarly, Vallejo *et al.* (2019) identified science granting councils in sub-Saharan Africa as crucial public sector innovation intermediaries, vital for shaping science, technology and innovation policies and fostering public–private partnerships.

However, Selviaridis and Spring (2024) stated: "[…] research on supplier-enabled innovation has underplayed the contribution of innovation intermediaries". Indeed, an initial exploratory search revealed that research on innovation intermediaries in public procurement is limited to a few case studies (Edler and Yeow, 2016; Landoni, 2017; Selviaridis *et al.*, 2023; Selviaridis and Spring, 2024; Tokumaru, 2022; van Winden and Carvalho, 2019). These studies provide valuable insights into the roles of innovation intermediaries within specific procurement contexts, offering detailed accounts of how intermediaries operate within particular industries, regions and contexts. However, these case studies are closely tied to their specific settings, which limits their applicability and makes it challenging to build a comprehensive knowledge base for understanding innovation intermediaries in public procurement on a broader scale. On the contrary, recent literature reviews on innovation intermediaries in general, such as those by Caloffi *et al.* (2023) and Zhang and Liu (2024), have begun to provide a comprehensive overview of the field by employing methods like bibliometric analysis and computational reviews, covering hundreds of articles on innovation intermediaries outside public procurement. To bridge this gap, this study aims to examine the current state of research on innovation intermediaries by analysing how these entities are addressed in systematic literature reviews (SLRs), specifically focusing on the extent to which public procurement is addressed. To achieve this objective, the study employs the following research questions (RQ):

RQ1. To what extent is public procurement considered in SLRs on innovation intermediaries?

RQ2. What insights from SLRs on innovation intermediaries can be transferred to enhance the understanding of these entities in a public procurement context?

To answer the RQs, this study first analyses the extent to which public procurement is addressed in existing SLRs on innovation intermediaries, identifying recurring contexts, thematic emphases and gaps in consideration. This provides a systematic assessment of whether and how public procurement is integrated into the discourse on innovation intermediaries (*RQ1*). Following this analysis, the study discusses how insights from SLRs on innovation intermediaries can be transferred to a public procurement context (*RQ2*). This discussion moves beyond identifying gaps and trends to explore how established innovation intermediary roles align with the institutional, regulatory and operational demands of public procurement. To ensure a contextually grounded discussion, the study presents a classification of 90 innovation

intermediaries in public procurement as empirical phenomena within the EU. Buoyed by the advantages of a review of reviews in "[…] the translation of research findings into recommendations, and also for identifying new research directions" (Schlesinger *et al.*, 2019), the findings inform researchers, policymakers and procurement professionals about the current knowledge landscape on innovation intermediaries and their potential to support innovation in public procurement.

2. Methodology

Given the extensive research already conducted on innovation intermediaries outside the realm of public procurement, including several SLRs, the methodology of a review of reviews was chosen to address the research questions (Durach *et al.*, 2017). Several previous studies have utilised this methodology, focusing on SLRs as the unit of analysis rather than primary studies (Carter and Washispack, 2018; Faulkner *et al.*, 2022; Haby *et al.*, 2024; Smith *et al.*, 2011). A review of reviews is particularly suitable in cases where a field has matured to the point where multiple SLRs exist, enabling a synthesis of higher-order insights. Rather than summarising existing literature, this methodology facilitates a meta-synthesis of SLR findings on innovation intermediaries, identifying overarching patterns, theoretical developments and research gaps (in accordance with RQ1) that may not be apparent in individual studies (Carter and Washispack, 2018; Faulkner *et al.*, 2022; Haby *et al.*, 2024; Smith *et al.*, 2011).

SLRs are based on a transparent and replicable collection and analysis of literature (Durach *et al.*, 2017). This study uses a review of reviews methodology, opting for such SLRs as the unit of analysis. The methodological approach primarily follows the SLR guidelines outlined by Durach *et al.* (2017), while also incorporating insights and techniques from articles utilising a review of reviews approach (Carter and Washispack, 2018; Faulkner *et al.*, 2022; Haby *et al.*, 2024; Smith *et al.*, 2011). In the following, this approach is described (Figure 1).

To avoid common biases in conducting literature reviews, as outlined by Durach *et al.* (2017), several mitigation measures were implemented to ensure methodological rigour. For detailed definitions and corresponding measures for each bias, see Appendix 1. *Retrieval bias* and *inclusion criteria bias* were mitigated by targeting the search specifically at intermediaries involved in innovation, rather than those associated with financial brokering or change management. Additionally, the search strategy and keywords were discussed and tested among the authors (Durach *et al.*, 2017). Consequently, two groups of keyword combinations were formed, following the guideline "[…] that the search applies a combination of keywords, which are based on the research purpose, research question(s) […], and inclusion/exclusion criteria […]" (Durach *et al.*, 2017). The first keyword group is based on the findings of the iterative search, leading to the understanding that the most commonly used term is innovation intermediary, followed by innovation broker. Hence, the keyword group contains the keywords "innovation intermediaries", "innovation intermediation", "innovation hub" or "innovation broker". The second keyword group is based on the keyword group Carter and Washispack (2018) utilised in their review of reviews and contains the search terms "systematic review", "structured review", "meta-analysis" or "literature review". Search terms pertaining to procurement or the public sector were not included, as it is the research objective to understand to what extent public procurement is considered in SLRs on innovation intermediaries. The keywords were then combined using the Boolean operator "AND" to search for relevant literature in different scientific databases (Denyer and Tranfield, 2009). The search was carried out in multiple databases (to further mitigate *retrieval bias*): SCOPUS, Wiley Online Library,

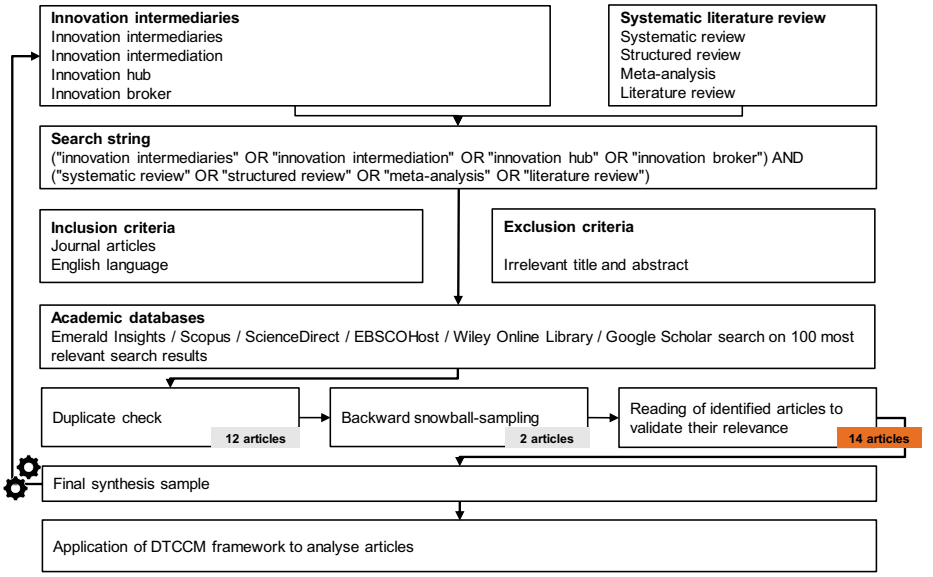

Figure 1. Research design concerning the review of reviews
Source: Authors' own work

Emerald Insights, EBSCO Host and ScienceDirect (Figure 1). The search covered the categories "Title", "Abstract" and "Keywords" (Hiebl, 2021).

Furthermore, *publication bias* refers to the tendency for studies with statistically significant or positive findings to be more frequently published than those with null or negative results (Thornton and Lee, 2000). This issue is widely acknowledged in medical meta-analyses and is often addressed through statistical tools such as funnel plots (Dubben and Beck-Bornholdt, 2005; Marks-Anglin and Chen, 2020; Smith *et al.*, 2011). However, the present study focuses on SLRs as units of analysis and thus on conceptual framings rather than statistical outcomes. Durach *et al.* (2017) recommended considering journal editorial policies as a potential remedy, yet they also acknowledge the lack of such policies in supply chain management (SCM) journals. In response, and building on broader methodological principles of Durach *et al.* (2017), this study applied broad and transparent inclusion criteria. These criteria were designed to capture all SLRs concerning innovation intermediaries, irrespective of whether they explicitly address public procurement or how they interpret its role or relevance within their findings.

Before the search was carried out, such exclusion and inclusion criteria were defined (Durach *et al.*, 2017). In line with Durach *et al.* (2017), who used the same approach in their review, only journal articles published in English were considered. This decision is grounded in their reasoning that "English is the dominant research language in the SCM discipline; [it] ensures accessibility and comparability of results" (Durach *et al.*, 2017). To avoid *selector bias*, two out of the three authors were involved in the search process. They followed a "blind" detection and evaluation process, while the third author helped to resolve any formal or content-wise disagreements (Durach *et al.*, 2017). The search identified 10 articles in ScienceDirect, 0 in Emerald Insights, 9 in EBSCOHost, 54 in Scopus and 1 in the Wiley Online Library. In a final step, an additional Google Scholar search was conducted using the

specified search string. This approach allowed the authors to identify ten additional relevant articles by applying the inclusion and exclusion criteria to the 100 most relevant articles listed. All identified articles were first examined by title and abstract and were categorised as "relevant" or "not relevant". An article was thereby considered relevant when it contained insights from the following two perspectives: insights on innovation intermediaries and their involvement in innovation processes and constituting an actual stand-alone SLR that did not serve as a basis to develop subsequent empirical research. This led to a total of 12 relevant publications (Table 1). Therefore, the initial synthesis sample consists of the following journal articles:

Subsequently, backward snowballing was carried out (Webster and Watson, 2002). Referenced journal articles that included words from the second keyword group were analysed based on the perspectives of relevance mentioned earlier. This led to two further publications, making up the synthesis sample of 14 publications (Table 2). Other reviews of reviews have based their analysis on similar sample sizes (Faulkner *et al.*, 2022; Haby *et al.*, 2024).

Table 1. Initial synthesis sample

Author and year	Title	Journal	AJG ranking 2024
(Abbate *et al.*, 2013)	Linking entities in knowledge transfer: the innovation intermediaries	*Journal of the Knowledge Economy*	1
(Gliedt *et al.*, 2018)	Innovation intermediaries accelerating environmental sustainability transitions	*Journal of Cleaner Production*	1
(Kivimaa *et al.*, 2019)	Towards a typology of intermediaries in sustainability transitions: a systematic review and a research agenda	*Research Policy*	4*
(Sousa *et al.*, 2021)	Influences of intermediation of support institutions on innovativeness and organizational performance	*Future Studies Research Journal: Trends and Strategies*	-
(Aljalahma and Slof, 2022)	An updated systematic review of business accelerators: functions, operation, and gaps in the existing literature	*Journal of Open Innovation: Technology, Market, and Complexity*	-
(Caloffi *et al.*, 2023)	Innovation intermediaries' types and functions: a computational analysis of the literature	*Technological Forecasting and Social Change*	3
(Feser, 2023)	Innovation intermediaries revised: a systematic literature review on innovation intermediaries' role for knowledge sharing	*Review of Managerial Science*	2
(Noviaristanti *et al.*, 2023)	The different roles of innovation intermediaries to generate value	*Management Review Quarterly*	1
(Just, 2024)	Natural language processing for innovation search – reviewing an emerging non-human innovation intermediary	*Technovation*	3
(Lepore, 2024)	Intermediaries in innovation systems: match or mismatch?	*Journal of the Knowledge Economy*	1
(Malaver Rodríguez *et al.*, 2024)	Knowledge intermediaries and innovation systems: exploring a neglected theoretical potential	*Journal of Technology Management & Innovation*	-
(Zhang and Liu, 2024)	Innovation intermediaries: a review, bibliometric analysis, and research agenda	*The Journal of Technology Transfer*	3

Source(s): Authors' own work

Table 2. Further publications added to the final synthesis sample

Author and year	Title	Journal	AJG ranking 2024
(Jamil *et al.*, 2015)	A review of commercialization tools: university incubators and technology parks	*International Journal of Economics and Financial Issues*	–
(Hossain *et al.*, 2019)	A systematic review of living lab literature	*Journal of Cleaner Production*	1

Source(s): Authors' own work

Reviews of reviews require a careful synthesis of existing research, often dealing with challenges like data overlap, heterogeneity and varying methodological quality (Faulkner *et al.*, 2022; Smith *et al.*, 2011). Presenting the findings from multiple SLRs requires clarity, structure and careful consideration of heterogeneity across reviews, helping to convey the overall evidence while acknowledging differences in study designs and outcomes (Faulkner *et al.*, 2022). Hence, to analyse the identified SLRs and mitigate *within-study-bias*, the theory–context–characteristics–methodology (TCCM) framework is used (Paul and Menzies, 2023). This framework offers a structured approach to analysing and synthesising the SLRs by using the criteria of Theories (T), Contexts (C), Characteristics (C) and Methods (M) (Jebarajakirthy *et al.*, 2021; Paul and Rosado-Serrano, 2019). This framework was selected for its ability to provide a comprehensive overview of SLRs on innovation intermediaries (Figure 2).

By applying this framework in its entirety, the study aims to address *RQ2*, focusing on understanding the current state of research on innovation intermediaries. Firstly, the emphasis here is not specifically on public procurement but rather on how these entities are being studied in SLRs, including definitions, underlying theories, methodological approaches and study characteristics. Following this broad analysis, the discussion

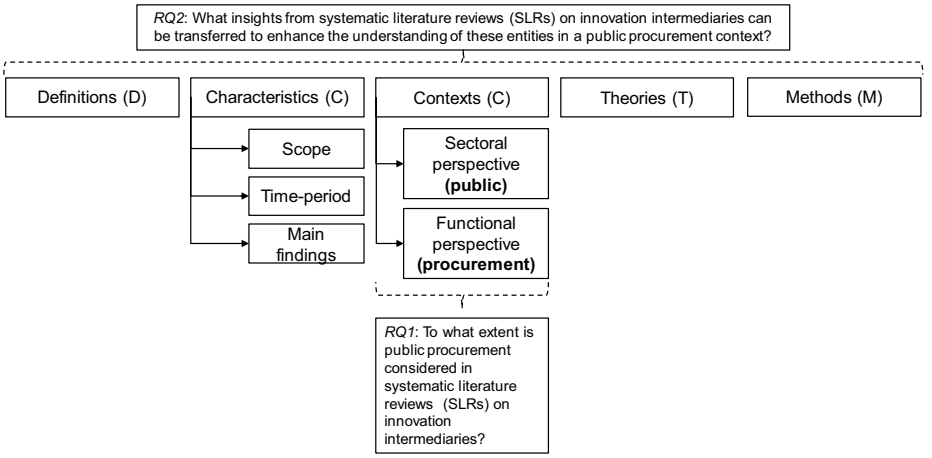

Figure 2. DCCTM framework
Source: Authors' own work

chapter elaborates on how these insights can help to enhance the understanding of these entities in a public procurement context. To address *RQ2* in the findings chapter, the approach is refined by splitting the analysis into two perspectives: one on the public sector and the other on the procurement function. This approach ensures that the framework not only provides a comprehensive analysis of innovation intermediaries (*RQ2*) but also directly aligns with the specific research question related to public procurement (*RQ1*).

The order of dimensions has been changed and the framework in this study is supplemented by the dimension "Definitions". Hence, the acronym DCCTM is used.

3. Findings

The SLRs in the synthesis sample were published between 2013 and 2024 (Figure 3). The data reveals that 9 out of the 14 articles were published since 2021, indicating a notable increase in the number of SLRs on innovation intermediaries in recent years. This trend suggests a growing academic interest and focus on the topic. Particularly noteworthy is the acceleration in publication pace in 2023.

Two journals – *Journal of the Knowledge Economy* and *Journal of Cleaner Production* – have two publications from the sample. The remaining outlets feature single publications of SLRs on innovation intermediaries. The distribution suggests that research on innovation intermediaries is well-established and primarily concentrated in the fields of innovation policy, innovation management and technology research. Purchasing and supply management research is a multidisciplinary field that draws on reference disciplines such as Operations Management, Marketing and Strategy and Organization (Wynstra *et al.*, 2019). As shown in Figure 4, none of the journals pertain to this research field. In addition, none of the journals pertain to public or government centred research fields such as public management and public administration (Pitts and Fernandez, 2009). Hence, concerning *RQ1*, this descriptive analysis suggests an initial indication of a gap in procurement-related and public sector related research on innovation intermediaries.

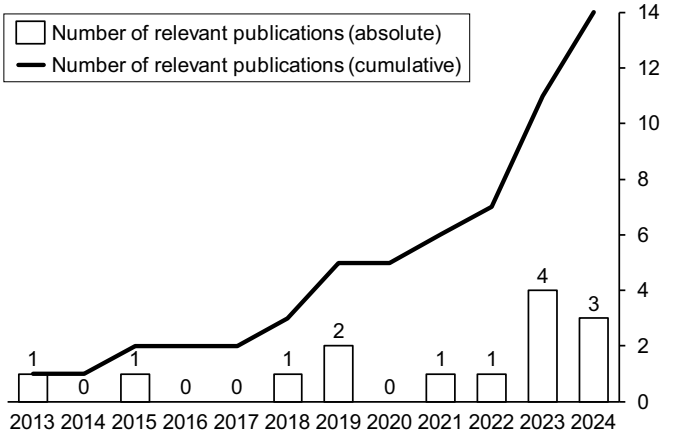

Figure 3. SLRs on innovation intermediaries over time
Source: Authors' own work

Figure 4. Publication outlets
Source: Authors' own work

3.1 Definitions

Concerning definitions of innovation intermediaries in the analysed SLRs, several findings can be derived from the synthesis sample. Firstly, the definition of Howells (2006) – "An organization or body that acts an agent or broker in any aspect of the innovation process between two or more parties" – seems to take a key role in research, as 6 out of the 14 SLRs refer to this definition. Two SLRs provide novel definitions, as they both cover unique types of intermediaries as their unit of analysis:

Aljalahma and Slof (2022): "Business accelerators have emerged as an important innovation intermediary, with their primary role identified as stimulating premature startups through mentorship and training programs".

Kivimaa *et al.* (2019): "[…] actors and platforms that positively influence sustainability transition processes by linking actors and activities, and their related skills and resources, or by connecting transition visions and demands of networks of actors with existing regimes in order to create momentum for socio-technical system change, to create new collaborations within and across niche technologies, ideas and markets, and to disrupt dominant unsustainable socio-technical configurations".

Going beyond the SLRs in the synthesis sample, research in public procurement has identified innovation intermediaries as an empirical phenomenon. An initial review of identified case studies and publications by the European Commission prompted an exploratory search on definitions on innovation intermediaries in public procurement (Table 3). The focus of this brief analysis is to inform the subsequent research, rather than to provide a new typology.

Considering the essential characteristics, all definitions describe an intermediary role that involves linking or facilitating connections between different entities, particularly in the context of fostering innovation. The core function is to bridge gaps between parties that need to interact for innovation to occur. The distinctions lie in the scope and focus of the intermediary roles. Some definitions emphasise the role in public procurement (e.g. facilitating interactions between public solution seekers and providers), whereas others focus on a broader range of interactions within the innovation process, including matching supply with demand and supporting the innovation life cycle as a whole.

Table 3. Sources referring to innovation intermediaries in public procurement

Author and year	Term	Definition
(Edler and Yeow, 2016)	Innovation intermediary	"… provides a link between at least two entities which need to connect in order to generate or adopt innovation, but which do not do so sufficiently without having a linking device or linking support …"
(Landoni, 2017)	Innovation intermediary	No original definition
(van Winden and Carvalho, 2019)	Innovation intermediary	No original definition
(European Commission, 2020a)	Innovation public procurement broker	"… intermediary in the interaction between public solution seekers and all the possible solution providers (individuals, organisations, etc.) aimed to support public procurement of research services or of innovative solutions"
(European Commission, 2021)	Innovation broker	"Innovation broker can be any institution with the capacity and purpose to match nascent innovation with a need on the demand side. The broker can be part of the overall innovation life cycle and a driving force behind the innovation procurement. It can be actively engaged in funnelling ideas from potential suppliers of innovation to networks of potential public buyers of innovation, be it cities, hospitals, civil protection authorities or any other relevant public buyer. Inversely, it can communicate to the relevant industry the needs of the public buyers. Innovation brokers can also facilitate the preparation of innovative ideas for specific public procurement procedures"
(Tokumaru, 2022)	Innovation intermediary	No original definition
(Selviaridis *et al.*, 2023)	Innovation intermediary	Referring to the definition of Howells (2006): "An organization or body that acts an agent or broker in any aspect of the innovation process between two or more parties"
(Selviaridis and Spring, 2024)	Innovation intermediary	"Innovation intermediaries, broadly defined as organizations operating at the demand–supply interface and supporting the innovation process (Howells, 2006), can help buyers and suppliers in overcoming their capability limitations"

Source(s): Authors' own work

3.2 Characteristics

The scope of included articles in the analysis of SLRs demonstrates considerable variation, with the number of articles ranging widely across different studies. On average, SLRs incorporate 264 articles, with a standard deviation of 373. The smallest data set includes 27 articles, while the largest encompasses as many as 1,404 articles, illustrating the diverse scale of analyses conducted in these reviews. The breadth of prior research on innovation intermediaries, as reflected in the diverse range of articles captured in the reviews, underscores the relevance of *RQ1* and supports the rationale for employing a review of reviews as the methodological approach for synthesising existing knowledge.

Regarding the temporal coverage, the range of years examined also varies across the SLRs. The earliest article identified originates from the sample analysed by Caloffi *et al.* (2023), which includes research dating back to 1976 as part of their computational analysis of literature on innovation intermediaries. However, the majority of the SLRs focus on a more recent time

frame, with at least ten out of the 14 reviews spanning the years 2004–2018. Notably, all the SLRs incorporate studies from the years 2010 to 2012, underscoring a concentrated focus on research produced during this period (Figure 5).

In summary, the main findings of the SLRs highlight the multifaceted roles and types of innovation intermediaries across various contexts. These intermediaries are considered crucial in facilitating knowledge transfer and collaboration, driving the development of new products and services and fostering innovation through commercialisation and entrepreneurship (Jamil *et al.*, 2015). University incubators, technology parks and sustainability-oriented intermediaries are particularly noted for their contributions to commercialisation and green economic development (Gliedt *et al.*, 2018; Kivimaa *et al.*, 2019). The literature also underscores the importance of living labs as multidisciplinary platforms for innovation and the critical roles of systemic and niche intermediaries in guiding sustainability transitions (Hossain *et al.*, 2019). In addition, the findings emphasise the complex roles of innovation intermediaries in bridging gaps between different stakeholders, supporting the commercialisation of new technologies and addressing challenges related to organisational and financial constraints (Aljalahma and Slof, 2022; Feser, 2023; Lepore, 2024). Over time, the diversification and specialisation of innovation intermediaries have become more pronounced, especially in the contexts of sustainability and digital transformation (Lepore, 2024). In a recent article, Just (2024) describes the potential of natural language processing as a non-human innovation intermediary capable of detecting potential solutions. Zhang and Liu (2024) provided a comprehensive overview of research on innovation intermediaries, highlighting the most influential journals and authors in the field. They map research streams by analysing keywords and journals, revealing a strong focus on technology and innovation management as well as policy. These insights underscore the evolving and expanding significance of innovation intermediaries within the innovation landscape.

3.3 Contexts

The analysis of public procurement perspectives in SLRs on innovation intermediaries is divided into three steps (Figure 6). In the first step, the SLRs are screened for terms pertaining to public procurement to develop an understanding of the frequency this perspective is considered. Secondly, a categorisation of the SLRs is performed, based on the

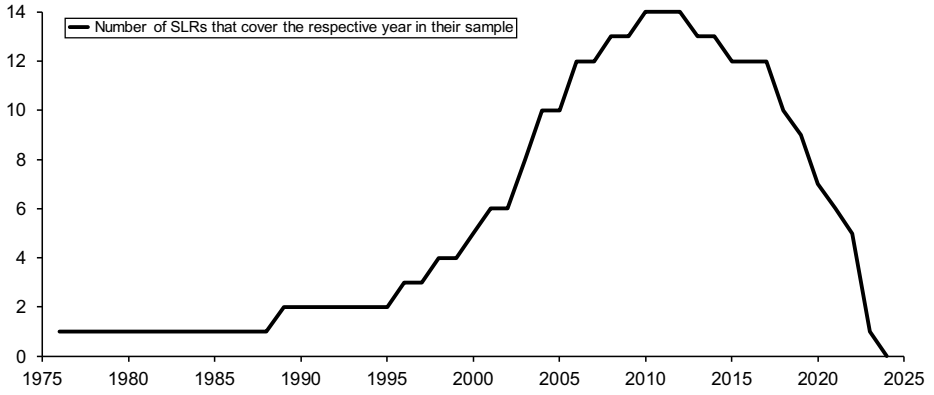

Figure 5. Time-periods covered in SLR analyses
Source: Authors' own work

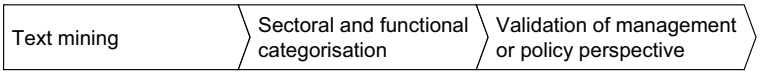

Figure 6. Methodology of analysing public procurement perspectives in SLRs on innovation intermediaries
Source: Authors' own work

sectoral perspective (public) and the functional perspective (procurement). In the third step, the SLRs that demonstrate a focus on the sectoral or functional perspective are validated by assessing the extent to which they address innovation either at the policy level or the management level.

The first step of the analysis applies a term-based text mining methodology, drawing on the principles outlined by Gaikwad *et al.* (2014). The aim of this step is to explore cursorily the extent to which public procurement is considered in SLRs on innovation intermediaries. Text mining is a process of extracting semantically meaningful information from unstructured or semi-structured text data (Gaikwad *et al.*, 2014). The method is particularly suited to answer *RQ1*, as it allows for a systematic and quantitative analysis of large volumes of text, such as those found in SLRs, to identify patterns, trends and the presence of specific terms or concepts. By focusing on specific terms related to public procurement, this approach enables the identification of the frequency and context in which these terms appear within the literature. The full-text search uses the terms illustrated in the following figure to the PDF search function (Figure 7). This intentionally includes the reference lists, to also capture referenced articles that are published in journals pertaining or adjacent to the procurement function and the public sector. It must be noted that the word *acquisition* is mostly found in combination with the word *knowledge*, not necessarily being concerned with procurement of services or products. Similarly, the word *supply* was mostly found in combination with the word *demand*, pertaining

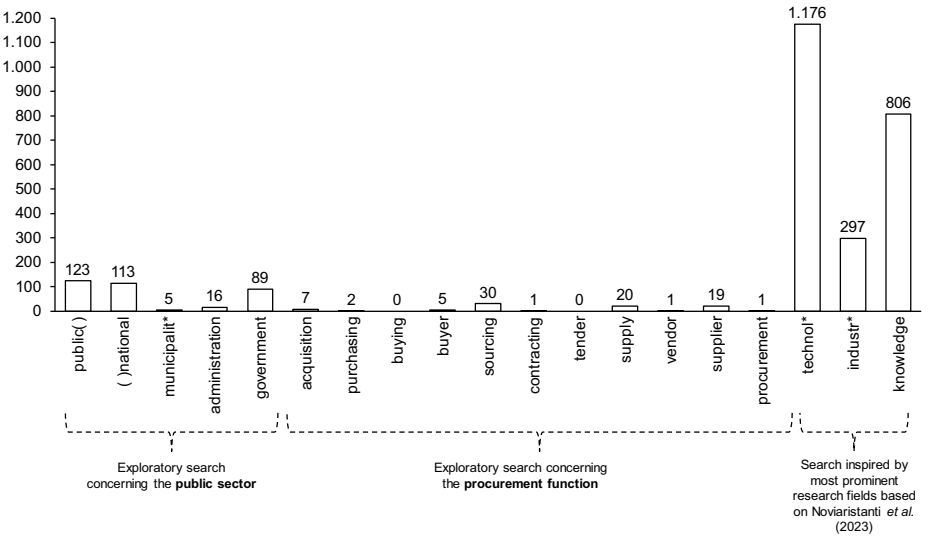

Figure 7. Explorative analysis on terms pertaining to public procurement in SLRs
Source: Authors' own work

to market-driven innovation policies. *Sourcing* was mostly found in combination *knowledge* and *cloudsourcing platforms* as information sources for innovation intermediaries (Just, 2024). In addition, inspired by the clusters defined by Noviaristanti *et al.* (2023), the terms "technol*", "industr*" and "knowledge" were searched across all articles.

In the second step, based on the findings from the explorative analysis, each publication in the synthesis sample has been examined. The findings were iteratively validated and adjusted by the group of authors. All SLRs from the synthesis sample have then been categorised, based on the degree to which they have considered the public sector from a sectoral perspective and the procurement function from a functional perspective. For both perspectives, four categories have been defined: not addressed, addressed as digression, addressed as topic and main focus of study. The allocation of the SLRs to the four categories is based on the following logic:

(1) Category "not addressed" – when the text mining and subsequent validation failed to identify any mention of the perspective in the SLR.

(2) Category "addressed as digression" – when the perspective was mentioned incidentally or peripherally in the literature rather than being a central focus. Following the findings of the text mining process, each identified mention was assessed to determine whether it represented a significant discussion or merely a passing reference. If the perspective was found to be only briefly mentioned not directly related to the core research question, it was allocated to this category.

(3) Category "addressed as topic" – when the perspective was either identified as a distinct research stream or explicitly stated as a significant part of the research on innovation intermediaries. This means that the literature not only acknowledged the perspective but also devoted specific attention to it, discussing its implications, applications or theoretical underpinnings.

(4) Category "main focus of study" – when the perspective was specifically addressed in the research objectives, the research questions or the title of the SLR.

The allocation of the SLRs from the synthesis sample to these categories is illustrated below (Figure 8).

It is noteworthy that only two of the SLRs did not include the public sector in their analysis. The more recent SLRs, in particular, seem to incorporate the public sector as a key area of focus. However, none of the SLRs explicitly identify the procurement function as a primary research topic, addressing it only in passing. Moreover, four out of the five SLRs that mention procurement also discuss the public sector, albeit briefly. This observation suggests that while research on innovation intermediaries is predominantly centred in the private sector, when procurement is addressed, it is typically within the context of the public sector. To substantiate this observation, a closer examination of the SLRs was subsequently conducted.

In the third step, the SLRs are validated by analysing the extent to which they address innovation, either at the policy level or the management level. Among the 14 SLRs on innovation intermediaries, 6 specifically address the public sector as a research topic. Feser (2023) examined the general characteristics of intermediaries, noting that they may be fully or partially publicly owned. He emphasises the importance of public funding and other governmental resources as strategic assets for innovation intermediaries. Feser also discusses government and public policies, explaining that innovation intermediaries facilitate multi-stakeholder relationships, which foster collaboration and influence policy direction through long-term policy support. These intermediaries bridge gaps between local governments,

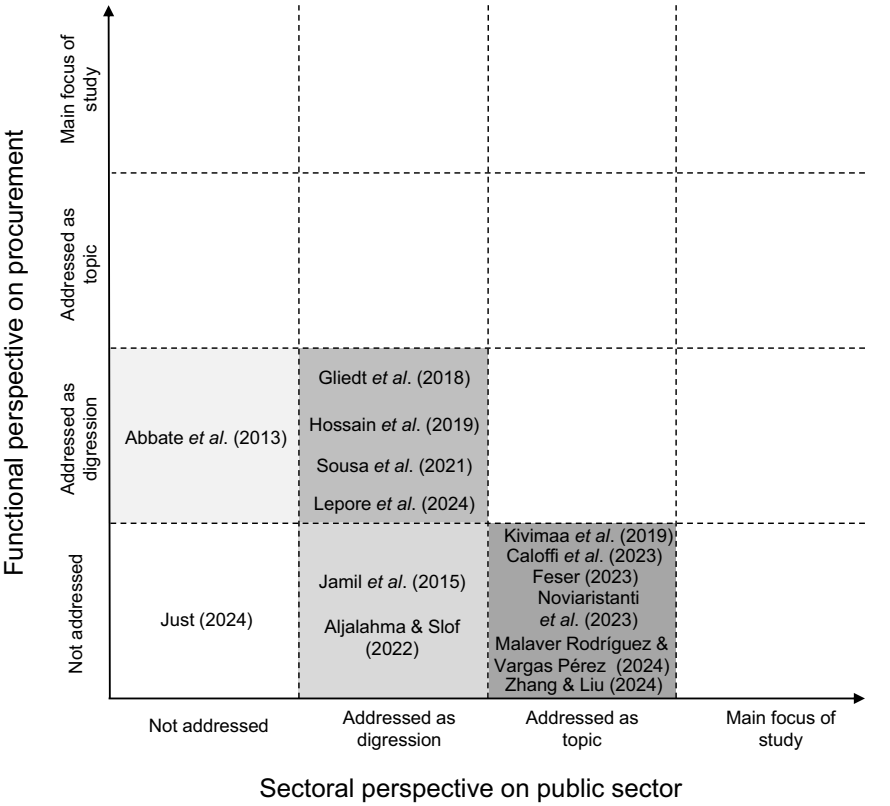

Figure 8. Public sector and procurement function perspectives in SLRs
Source: Authors' own work

funding bodies, trade associations and supranational entities like the EU. They play crucial roles in lobbying, setting agendas and aligning policies with long-term goals, including innovation and environmental objectives. In addition, they assist in implementing regulations and standards, ensuring that policies are effectively translated into actionable procedures. Malaver Rodríguez *et al.* (2024) discussed the role of innovation intermediaries within innovation systems and implicitly discuss their potential relevance for public sector innovation policies. They argued that intermediaries help bridge systemic gaps between different actors, facilitating knowledge flows and collaboration. The study points out that innovation policies can rely on intermediaries to support regional development and industry growth. However, the incorporation of intermediation into innovation systems frameworks has been mostly empirical rather than theoretical, suggesting that its role in innovation systems (implicitly – public sector innovation) could be further explored. Caloffi *et al.* (2023) discussed public ownership structures, particularly in relation to innovation system intermediaries, and highlighted that transition intermediaries promote organisational change in public administration, as well as transitions towards environmental sustainability and institutional change in society. Kivimaa *et al.* (2019) emphasised the public sector's role in sustainability transitions by showcasing its involvement in creating and supporting transition

intermediaries, which are often established by public sector actors like government agencies or regional authorities to facilitate transformative change. Zhang and Liu (2024) explored the different ownership structures of innovation intermediaries, providing examples of both public (e.g. Science Parks and Technology Parks) and privately owned intermediaries. They also identify the *Journal of Science and Public Policy* as a leading publication in the field, based on its high number of publications (however, not based on the citations). Noviaristanti *et al.* (2023), through their bibliometric analysis of 257 articles, observed that "[b]etween 2012 and 2017, cognition, national innovation system, strategic approach and public policy became more important whereas between 2018 and 2022, innovation systems, programs, technology transfer, open innovation, decision-making and sustainable development became more important for the intermediary research field". What is particularly noteworthy here is the distinction in focus between public and private sector contributions. Research on the public sector tends to concentrate on innovation policy, reflecting the sector's role in setting the strategic and regulatory frameworks within which innovation intermediaries operate. On the other hand, the private sector appears to place greater emphasis on management-level concerns, particularly in areas such as technology transfer, decision-making processes and program implementation.

Five of the 14 SLRs on innovation intermediaries address the procurement function only tangentially. Abbate *et al.* (2013) briefly discussed innovation solvers as "buyers and sellers of intellectual properties" and mention intermediaries' role in matching supply and demand, but do not delve into further details. The other four SLRs combine their discussion of procurement with the public sector. Among them, Gliedt *et al.* (2018) are the only authors in the synthesis sample to explicitly mention the term "public procurement". They identify it as a critical policy instrument, supported by regime actors such as policy entrepreneurs, to enhance innovation systems by fostering niche innovations. Public procurement is noted as a tool for adopting and scaling new technologies, but the role of innovation intermediaries in this process is not specifically detailed, with the term mentioned only once in the article. Hossain *et al.* (2019) discussed living labs as innovation intermediaries within the open innovation paradigm, which relies on external sources of innovation, including suppliers; however, this is only briefly mentioned and not further elaborated. Sousa *et al.* (2021) referenced eight articles including term "suppl*" in their titles but do not directly consider the procurement function in their SLR, treating suppliers as one of several external sources of innovation alongside scientific parks, universities, financial institutions and competitors. Lepore (2024), focusing on innovation intermediaries in regional and national innovation systems, mentioned market-oriented brokers who manage interactions between suppliers and demanders, but does not explore the procurement function in detail. Lepore's article categorises intermediaries based on ownership structure, distinguishing between public innovation intermediaries, government-funded organisations and others such as industrial associations or incubators.

The role of the procurement function in research on innovation intermediaries is often addressed only tangentially and lacks detailed exploration, especially considering a PPoI management level. Among the 14 SLRs examined, only 5 briefly mention procurement, often in the context of public sector activities. While public procurement is identified as a critical tool for fostering innovation, the specific role of innovation intermediaries in this process is not thoroughly examined. As a result, discussions tend to focus even more on the policy level than on the PPoI management level. The discussions generally treat procurement as a peripheral element, focusing more on the broader functions of intermediaries within innovation systems. This indicates a gap in the literature that could benefit from further

research into the intersection between innovation intermediaries, procuring organisations and suppliers (Edler and Yeow, 2016).

3.4 Theories

Only 3 out of the 14 SLRs take on a theoretical perspective in their analysis (Gliedt *et al.*, 2018; Kivimaa *et al.*, 2019; Lepore, 2024). Gliedt *et al.* (2018) used the multilevel perspective (MLP) framework as a theoretical lens to analyse the role of innovation intermediaries in sustainability transitions. The MLP framework differentiates between three levels: niche (where innovations are developed), regime (semi-stable structures like institutions and technologies) and landscape (broader societal processes). By aligning niche innovations with regime structures, intermediaries play a crucial role in guiding and accelerating transitions during political and institutional uncertainties. Lepore (2024) used the "Systems of Innovation" framework, which is referred to as regional innovation systems or national innovation systems depending on the geographic scope, to guide the research. This framework focuses on the complex interactions among various actors that contribute to innovation and technological advancement, emphasising the connections between innovation, learning and the economic performance of specific regions. Similarly, Kivimaa *et al.* (2019) focus on transition theories in their SLR.

3.5 Methods

Nine of the 14 SLRs specifically state that they have performed a SLR. Lepore (2024) and Malaver Rodríguez *et al.* (2024) do not use the term "systematic" but follow specific guidelines for literature reviews. Zhang and Liu (2024), who cover 556 articles, conducted an SLR that they connect with a bibliometric analysis. Noviaristanti *et al.* (2023) covered 257 articles in a bibliometric analysis and Caloffi *et al.* (2023) performed a computational literature analysis on 1,404 articles.

4. Discussion and implications

In summary, the literature recognises the potential of innovation intermediaries mainly in the context of public policy, as identified by Noviaristanti *et al.* (2023). However, despite the proliferation of policies designed to encourage public organisations to engage in PPoI, research indicates that the public sector faces difficulties in *implementing* these policy recommendations effectively (Lember *et al.*, 2015). This implementation gap suggests that innovation intermediaries need to be considered more comprehensively at the management level, particularly from a public procurement management perspective (Edler and Yeow, 2016). Specifically, there is a need for empirical research that demonstrates how innovation intermediaries can support public contract award entities in overcoming barriers to PPoI. This focus is essential because while policies set the strategic goals, their successful implementation depends on individual procurement decisions made within competitive environments among suppliers. Understanding the role and functions of different types of innovation intermediaries in these processes could potentially enhance the effectiveness of PPoI (Edler and Yeow, 2016).

Interestingly, the finding that the operational roles of innovation intermediaries in public procurement management remain largely unexplored cannot be attributed to a lack of innovation intermediaries as empirical phenomena in public procurement. Recognising the mentioned implementation deficits of PPoI, e.g. the EU started to promote a row of initiatives to improve PPoI (European Commission, 2017). In addition to fostering competencies of public procurers, as highlighted by the European Commission (2020b), *innovation brokers* have been heavily endorsed. In their guidance on Innovation Procurement they promote innovation brokers as actors who can "[…] help to build or strengthen […] links between start-ups offering innovative solutions and innovation SMEs […] and public buyers […], [which are otherwise]

often weak and do not arise spontaneously" (European Commission, 2020a). Introducing innovation brokers "[…] should aim to mitigate […] issues [concerning the complex practical ways of interaction between contracting authorities, innovation broker(s) and suppliers by] offering concrete support to public buyers and public administrations […]" (European Commission, 2020a). In addition, the EU currently has projects underway to examine innovation intermediaries, their role and influence on innovative public procurement. From 2018 to 2020 the European Commission carried out a project aiming to establish innovation intermediaries in the EU by defining an Innovation Procurement Broker business model (Buchinger and Kienegger, 2020).

Efforts to establish innovation intermediaries in the member states of the EU are already evident, which prompted this study to conduct an exploratory investigation into innovation intermediaries in public procurement across the EU, leading to the identification of 90 such organisations (Appendix 2). This list was compiled as part of an action research project (Meehan *et al.*, 2016), in which the authors were involved in preparing a tender issued by the *European Innovation Council and SMEs Executive Agency* to establish a centralised innovation procurement hub in the EU. Led by a "German Purchasing Association" and a consultancy firm, the tender preparation project engaged subcontractors, including innovation intermediaries and public procurement experts from across the EU. One collaborative result was the list of existing innovation intermediaries as a status quo assessment of available resources.

Hence, innovation intermediaries are active, for example, in Germany ("Kompetenzzentrum innovative Beschaffung; KOINNO" and, "Bundesagentur für Sprunginnovationen" and "Cyber Innovation Hub der Bundeswehr"), Austria ("Innovationsfördernde öffentliche Beschaffung; IÖB), Italy (Concessionaria Servizi Informativi Pubblici), Ireland (Procurement Transformation Institute; PTI), Estonia (Enterprise Estonia; EAS), the Netherlands (Professioneel en Innovatief Aanbesteden, Netwerk voor Overheidsopdrachtgevers; PIANo), Portugal (Agência Nacional de Inovação; ANI), Sweden (National Agency for Public Procurement) and Spain (Centre for the Development of Industrial Technology; CDTI). It is noticeable that the sponsors (insofar as they are known) can be very different. While some competence centres (such as in Germany or Austria) are run as (time-limited) projects by professional associations on behalf of various ministries, Greece, for example, seems to have chosen the path of anchoring the competence centre as a permanent part of the ministerial organisational structure. The cases in Italy or Sweden can be interpreted similarly. Here, the respective competence centres are integrated into the existing public procurement agencies. It can be stated at this point that very different institutions can carry out the role of innovation intermediaries, that they can be set up as a project or as a permanent institution and that they can be operated as independent centres (with or without their legal personality) or as an integrated part of public authorities.

Furthermore, the 90 identified innovation intermediaries in the EU can be categorised based on whether their services specifically target public procurement and whether they operate a digital platform as part of their service portfolio (Appendix 2). This distinction emerged across multiple cases.

For example, KOINNO (Germany) operates a digital matchmaking platform called "KOINNOvationsplatz", which serves two key functions (KOINNO, 2025): Firstly, public organisations can upload "challenges" as part of their market screening, defining problems functionally rather than technically. Suppliers can then submit proposals outlining their approaches to these challenges. Secondly, suppliers can upload their market-ready innovations to a "marketplace of innovations", where public buyers can browse and search for solutions as well as supplier contacts. While some intermediaries focus solely on providing such platforms for market-ready innovations, KOINNO offers additional consultancy services and guidance for

procuring innovations that are not yet market-ready and may require adaptation or development for public-sector applications.

Based on these findings, and referring back to the insights from the SLRs on innovation intermediaries outside public procurement, a differentiation of innovation intermediaries' services is provided – distinguishing between low and high technology readiness levels (Figure 9). This approach is based on the call for further research on innovation intermediaries in public procurement by Edler and Yeow (2016), who emphasised the need for a better understanding of the role of innovation intermediaries in public procurement. The authors particularly highlight two dimensions regarding the state of technology readiness: on the one hand, when an existing solution (high technology readiness or market-ready supplier innovation) that is new to the public organisation is procured, and on the other hand, when the procurement process itself triggers the emergence of a supplier innovation (low technology readiness or non-market-ready supplier innovation).

Firstly, the public sector may prioritise acquiring market-ready innovations (high technology readiness levels) over developing them in-house, which could increase the demand for intermediaries to help identify and integrate these solutions from the supply market – for example by using matchmaking or marketplace platforms for market screening (Gallouj and Zanfei, 2013; Just, 2024). This focus on procuring ready-to-use innovations means that public entities may be less interested in the research and development knowledge and technologies typically emphasised in private sector innovation activities. Instead, their priority may be to efficiently integrate innovative products and services into their existing operations to enhance their offered services. However, especially smaller entities, such as municipalities and schools, might lack the resources to effectively target innovations that are already available on the supply market. Similar to the findings of Lepore (2024), Gliedt *et al.* (2018) and Just (2024), who describe the role of innovation intermediaries in screening

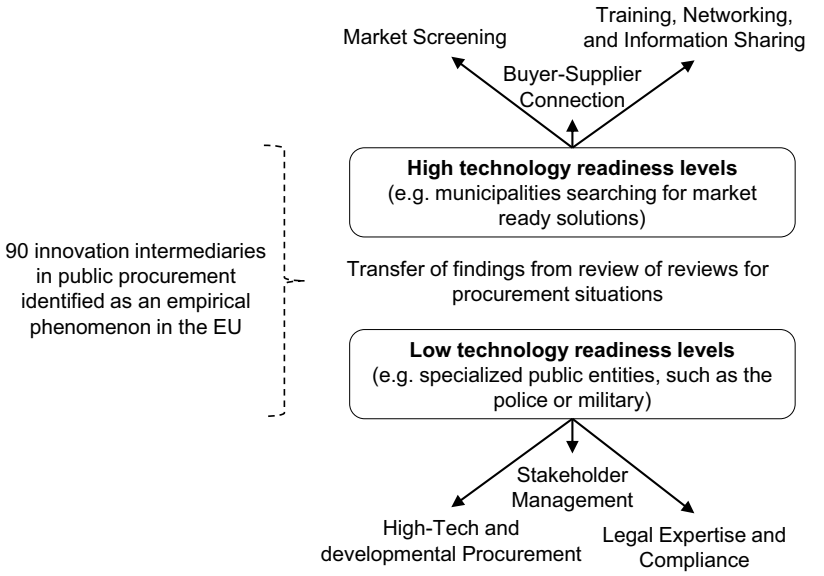

Figure 9. Innovation intermediaries in public procurement as an empirical phenomenon in the EU
Source: Authors' own work

markets for innovative solutions, innovation intermediaries in public procurement can play a crucial role in identifying market-ready innovations within the supply market. These intermediaries can effectively connect public procurers with suppliers offering efficiently implementable solutions (Edler and Yeow, 2016). In addition, innovation intermediaries can provide crucial training, networking and information-sharing services, enabling these entities to connect more effectively with the market and help suppliers to scale their innovations across multiple public organisations (Selviaridis *et al.*, 2023).

However, this dynamic is not universally applicable across all public sector organisations. Certain specialised public entities, such as the police, aerospace agencies, hospitals or military, may have unique procurement needs that involve lower levels of technological readiness (Evald *et al.*, 2023). These organisations might engage more deeply in the development and procurement of innovative products and services that are still in the early stages of their technological lifecycle. In these contexts, the role of innovation intermediaries extends beyond simply matching buyers and suppliers, as the procurement process is more complex due to higher degrees of interactions, prototyping and evaluations of innovations (van Winden and Carvalho, 2019). In this context, innovation intermediaries' roles in managing complex stakeholder relationships, as discussed by Aljalahma and Slof (2022), can be applied to public procurement. Transferred from the findings of Feser (2023), they might also provide crucial legal expertise to navigate the peculiarities of public procurement law, particularly when dealing with advanced procurement processes such as competitive dialogues or innovation partnerships (van Winden and Carvalho, 2019). Without such support, public organisations might need to hire external legal counsel, which can be costly and divert resources away from innovation. Moreover, relying mainly on legal experts could lead to an overemphasis on legal compliance at the expense of directing resources to innovation. Intermediaries offering both innovation and legal support, either as an in-house service or by mediating between public buyers, suppliers and legal counsel, could provide a more balanced approach, ensuring that the procurement process remains focused on achieving innovative objectives while staying within legal boundaries.

5. Conclusion

This study provides a comprehensive analysis of the current research landscape on innovation intermediaries, particularly focusing on how these entities are addressed in SLRs concerning public procurement. The findings reveal a significant gap in the literature, with most research predominantly centred on private-sector innovation and public policy-level discussions, leaving the operational roles of innovation intermediaries within (public) procurement largely unexplored.

This under-representation underscores the critical need for more focused research on how innovation intermediaries can effectively support public contract award entities. By highlighting this gap, the study contributes to the discourse by advocating for a deeper exploration of the mechanisms through which these intermediaries can enhance procurement processes at the management level, thereby indirectly contributing to broader policy objectives (Edler and Yeow, 2016). Future studies should aim to bridge this gap by investigating the practical applications and impacts of these intermediaries in public procurement settings, offering more robust and actionable guidance for policymakers and procurement professionals.

This study offers initial insights into how various types of innovation intermediaries can support public contract award entities in PPoI, particularly by addressing the complexity of the envisioned procurement projects. One type of innovation intermediary can support in supply market screening to identify ready-to-use innovations. Another type could provide support for procurement needs that involve lower levels of technological readiness. These

intermediaries also facilitate the management of complex stakeholder relationships, ensure compliance with public procurement law and aid in navigating advanced procurement processes.

Regarding limitations, the review of reviews approach, while offering a broad overview of existing SLRs, relies on secondary data, potentially overlooking emerging trends or nuanced discussions in public procurement that are more likely to be captured in primary research. Although the inclusion and exclusion criteria, as well as the search string, were carefully validated by the authors to avoid biases such as *retrieval bias*, *selection bias* and *within-study bias* (Durach *et al.*, 2017), relevant research may still have been inadvertently excluded, especially given the extensive and varied terminology surrounding innovation intermediaries. Finally, the broad categorisation of public procurement considerations might obscure specific instances where procurement plays a significant but subtle role in innovation intermediation, which may not have been fully captured in the SLRs analysed.

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Appendix 1

Table A1. Common biases and applied mitigation measures

Bias	Definition	Specific mitigation measures in this study
Retrieval bias	"Sampled articles are based on inadequate or incomplete search"	Multiple expert searchers were involved and are included as members of the author team. The search was explicitly targeted towards intermediaries for innovation. A diverse set of academic databases was used in the search process, as illustrated in Figure 1. A variety of potential keyword combinations were applied, drawing on the approach by Carter and Washispack (2018) and detailed in Figure 1
Publication bias	"Study findings that challenge or change existing knowledge are more likely to be published in leading journals"	Broad and transparent inclusion criteria were applied to ensure that all relevant SLRs on innovation intermediaries were captured. SLRs were included regardless of whether they explicitly address public procurement or how they frame its relevance or role
Inclusion criteria bias	"Inaccurate design of selection criteria"	The selection criteria, search and selection process and author discussions are reported transparently (Section 2). The search focused on academic journal articles published in English (Section 2)
Selector bias	"Subjective inclusion of studies affected by authors' perceptions regarding results, authors, or journals"	Multiple researchers were involved, following a blind review process: two authors independently conducted a blind assessment of contested articles, while a senior researcher participated to resolve any disagreements
Within-study bias	"Variability in coding …"	Coding was conducted by first developing and agreeing on data extraction schemes, following the TCCM framework (Subsection 3.3). To ensure validity, coding was manually reviewed and cross-checked by two contributing authors (Subsection 3.3)
Expectancy bias	"Synthesis of studies is influenced by the researchers' conscious/ unconscious expectations about the results"	In-depth discussions among multiple researchers informed the synthesis, particularly concerning the role of innovation intermediaries in public procurement as an empirical phenomenon (Sections 4 and 5)

Source(s): Based on Durach *et al.* (2017)

Appendix 2

Table A2. Innovation intermediaries in public procurement in the EU

Country (EU)	Innovation intermediary as empirical phenomenon	Abbreviation	Focus on procurement	Operator of a digital platform
Austria	Bundesbeschaffung GmbH	BBG	X	X
	Österreichische Forschungsförderungsgesellschaft	FFG	X	
	IÖB Kontaktstelle Wirtschaft	IÖB	X	X
	Österreichische Energieagentur – Austrian Energy Agency	AEA	X	
Belgium	Gov Buys Innovation (Flanders) Innoviris Brussels		X	X
	Flanders Innovation and Entrepreneurship	VLAIO		X
	Programma Innovatieve Overheidsopdrachten	PIO	X	
	Wallonie Entreprendre			
Bulgaria	Public Procurement Portal	PPA	X	
	Bulgaria Innovation Hub, Inc.		X	X
Croatia	Croatian Agency for SMEs, Innovations and Investments	HAMAG-BICRO	X	X
Republic of Cyprus	Cyprus Research and Innovation Centre	CYRIC		
	Research and Innovation Foundation	RIF		
	Digital Innovation Hub Cyprus	DiGiNN		
Czech Republic	Technology Agency of the Czech Republic	TACR	X	X
Denmark	Gate21			X
	Center for Offentlig-Privat Innovation	CO-PI	X	
	Danish Agency for Higher Education and Science	DAHES		
Estonia	Riigihangete			
Finland	Competence center for Sustainable and Innovative public procurement	KEINO	X	X
	Motiva Oy			
	Hansel Oy		X	
	Technical Research Centre of Finland	VTT		X
	The Finnish Environment Institute	SYKE	X	
	Kuntalitto - Association of Finnish Municipalities	AFM	X	
France	EcoLab – Greentech Innovation		X	X
	Lyon PactePME		X	X
	Bpifrance			
Germany	Kompetenzzentrum innovative Beschaffung	KOINNO	X	X
	Kompetenzstelle für nachhaltige Beschaffung	KNB	X	
	Zenit GmbH			

(*continued*)

Table A2. Continued

Country (EU)	Innovation intermediary as empirical phenomenon	Abbreviation	Focus on procurement	Operator of a digital platform
	Bundesagentur für Sprunginnovationen	SPRIND	X	
	Projektträger Jülich	PtJ	X	
	GovTech Group (ehem. GovMind MIRA)		X	X
	Fraunhofer-Gesellschaft (Innovation, Transfer und Verwertung)		X	
	United Innovations (UI) - Ableger der GFFT e.V.			
	Cyberinnovation Hub Bundeswehr		X	
	Venclÿ GmbH		X	X
	Wehrwissenschaftliches Institut für Werk- und Betriebsstoffe	WIWeB	X	
	Loesungenfinden.org GbR		X	
Greece	Promitheus		X	X
	Thessaloniki Innovation and Technology Center		X	
	Center for security studies	KEMEA	X	
	interBalkan Environment Center	i-BEC	X	
Hungary	National Research, Development and Innovation Office		X	
	Hungarian Innovation Agency	NIÜ	X	
Ireland	Office of Government Procurement		X	
	Enterprise Ireland		X	
	Procurement Transformation Institute	PTI	X	
(Iceland)	Icelandic Centre for Research	Rannís	X	
Italy	Appalti Innovativi			
	Open Innovation Lombardy			
	Concessionaria Servizi Informativi Pubblici	Consip S.p.A.	X	
	Agenzia per l'Italia Digitale	AgID	X	X
Latvia	Investment and Development Agency of Latvia	LIAA	X	
	City Innovation Hub		X	
(Liechtenstein and Switzerland)	Swiss Innovation Agency	Innosuisse	X	
Luxembourg	Luxinnovation GIE		X	
Malta	Xjenza Malta		X	X
The Netherlands	Professioneel en Innovatief Aanbesteden, Netwerk voor Overheidsopdrachtgevers	PIANOo	X	X
	Startup in Residence		X	X
	Starthubs		X	X
	Netherlands Enterprise Agency	RVO	X	
(Norway)	Leverandørutviklingsprogrammet Anskaffelser	LUP	X	X

(*continued*)

Table A2. Continued

Country (EU)	Innovation intermediary as empirical phenomenon	Abbreviation	Focus on procurement	Operator of a digital platform
	StartOff		X	
	Direktoratet for forvaltning og økonomistyrings	DFØ		
	Innovation Norway		X	
	Research Council of Norway			
Poland	National Centre for Research and Development	NCBR	X	X
	Uniwersytecki Inkubator Przedsiębiorczości	InQube	X	
	Polish Agency for Enterprise Development	PARP		
Portugal	Portuguese Competence Centre for Innovation Public Procurement	Procure+i	X	X
	Institute of Public Markets, Real Estate and Construction	IMPIC	X	
	Agência Nacional de Inovação	ANI	X	
	Laboratório Nacional de Energia e Geologia	LNEG	X	
	Direção-Geral das Autarquias Locais	DGAL		
Romania	Agenția pentru Dezvoltare Regională Nord-Est		X	
Slovakia	Slovak Innovation and Energy Agency	SIEA	X	
	Slovak Environment Agency	SEA	X	
Slovenia	SPIRIT Slovenia			
Spain	Conecta Research and Consulting		X	X
	Agència de Qualitat i Avaluació Sanitàries de Catalunya	AQUAS	X	X
	Centre for the Development of Industrial Technology	CDTI	X	X
	National Institute for Aerospace Technology	INTA		
	TICBIOMED			
	Energy Poverty Intelligence Unit (Urban Innovative Actions)	EPIU	X	
Sweden	National Agency for Public Procurement	UHM	X	X
	Kammarkollegiet		X	
	Vinnova		X	

Source(s): Authors' own work

Corresponding author
Hendrik Hermann Bangert can be contacted at: hendrik.bangert@unibw.de