Determinants of Open Innovation Adoption in Public Organizations: A Systematic Review

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This article presents a synthesizing framework of the determinants of open innovation adoption in public organizations. We examine the fragmented literature and integrate earlier results. To provide a theoretical foundation to our understanding of open innovation adoption, we categorize determinants identified in the literature based on three theoretical perspectives on organizations: transaction cost theory, resource-based theory, and institutional theory. Our study finds that a resource-based rationale is dominant in the literature. Considerations regarding transaction costs and institutional pressures have received less attention. We end the article with suggestions for future research.

Keywords: adoption; open innovation; collaborative innovation; determinants; systematic literature review

1. Introduction

In response to rising expectations of citizens, the proliferation of wicked and unruly problems, and to keep pace with technological advances, public organizations have become increasingly interested in more open and collaborative innovation practices (Bekkers and Tummers 2018; Torfing 2019). Open innovation (OI) refers to the purposeful efforts of a focal organization to enrich the innovation capacity with ideas or knowledge originating outside its boundaries, or to allow unused knowledge to flow outside the organization for others to use in their innovations (Dahlander and Gann 2010; West et al. 2014). By involving outside knowledge and other public and non-public actors in innovation processes, public organizations aim to be better positioned at facing grand challenges and solving public problems (Kankanhalli, Zuiderwijk, and Tayi 2017).

For many public organizations, OI represents a change to the dominant innovation paradigm. Public organizations often employ strategies that view innovation primarily as an inhouse activity and position the locus of innovation within the boundaries of the organization (Torfing 2019). OI implies a move away from this predominantly closed innovation model. It promotes adapting traditional innovation approaches to include external knowledge exchanges and collaborations with external actors.

Several authors have acknowledged that introducing openness in public innovation is a complex and challenging task (Crosby, 't Hart, and Torfing 2017; Mergel 2018; Smith, Sochor, and Karlsson 2019). In line with this, adoption of OI in a public organization can be regarded as a complex process that encompasses information-seeking and information-processing activities surrounding OI, leading to implementation in the organization (Frambach and Schillewaert 2002).

As many public organizations struggle to open up, the scholarly debate has focused on exploring determinants of the adoption of OI, that is, factors that positively or negatively influence the adoption of OI as a new innovation paradigm in public organizations (Kankanhalli, Zuiderwijk, and Tayi 2017). Factors that have a positive influence are considered to be drivers, whereas factors that have a negative influence are barriers that hinder public organizations to adopt OI (Mergel 2018). Importantly, the context-specificity of determinants means that a determinant can be a driver of OI adoption in some organizations but act as a hinderance in others (Randhawa, Wilden, and West 2019).

Exploring the determinants of OI adoption is important as it helps to explain why public organizations choose to adopt a strategy of OI. Moreover, identifying and

understanding the determinants of OI adoption provides insights into which factors may hinder or support the introduction of a new innovation paradigm in public organizations.

Currently, our knowledge of determinants of OI adoption in the public sector is constrained in several ways: *(a)* prior studies have usually focused on one or a few determinants within a limited number of organizations or diverse policy areas (Smith, Sochor, and Karlsson 2019; Zhang et al. 2017; Mergel 2018); *(b)* many articles present case studies, emphasizing deep insights instead of generalizability (Torfing 2016); and *(c)* much of the literature has focused on descriptive analyses, which has led to repeated calls to strengthen the theoretical foundations of OI research by '[using] related organizational theories […], and examine how they could be extended to explain open innovation phenomena in the public sector' (Kankanhalli, Zuiderwijk, and Tayi 2017).

To address these gaps, this study develops a theoretically-grounded synthesis of determinants of OI adoption in public organizations as mentioned in the literature. We examine the fragmented literature and integrate earlier results to contribute an overview of factors that influence the adoption of OI practices in the public sector. Aggregating the extant knowledge on this topic helps to build a more robust and transparent body of literature. Moreover, by consolidating the findings across previous articles we hope to stimulate the scholarly debate.

To provide a theoretical foundation to our understanding of OI adoption, we categorize the determinants identified in the literature based on three well-established theoretical perspectives on the nature of organizations: transaction cost theory, resource-based theory, and institutional theory. Organization theories offer a useful theoretical underpinning for this study's research objective as they help to understand the changing nature of organizations, their behaviour, actions, and decision-making, and the results of those actions, such as organizational structures (Ulrich and Barney 1984). In particular,

they allow to study OI adoption at the organization-level and to capture a variety of technological and non-technological determinants. Moreover, as different theories conceptualize change in organizations in different ways, a multi-lens inquiry allows to 'explore the partial truths of the different theoretical perspectives' (Freytag, Clarke, and Evald 2012) and enables a distinct categorisation of different types of determinants. The combination of the three perspectives we have chosen allows to incorporate economic, strategic, and relational elements that influence OI adoption: transaction cost theory provides an economic perspective focused on the characteristics of OI transactions, resource-based theory explores the resources that drive organizational decision-making, and institutional theory emphasizes the social pressures on public organizations of what constitutes appropriate behaviour.

The remainder of this article is structured as follows. We start by providing a background of OI in the public sector. We then discuss the theoretical perspectives used for categorizing the determinants of OI adoption. Next, we explain the methodology for data collection and analysis. We then present and discuss our findings. We conclude with directions for future research.

2. Background: OI in the Public Sector

OI has been defined as 'a distributed innovation process based on purposively managed knowledge flows across organizational boundaries, using pecuniary and non-pecuniary mechanisms in line with the organization's business model' (Chesbrough and Bogers 2014). It has gained recognition in a corporate context as a way for companies to attain a competitive advantage. In the public sector, OI focuses on 'changes in the form and content of services […] to enhance service performance and public value' (Kankanhalli, Zuiderwijk, and Tayi 2017).

OI in the public sector is still a concept with fuzzy boundaries that has, at times, been used interchangeably with other terms, and most prominently with collaborative innovation. On this subject, Pedersen (2020) notes that 'the many competing labels for this phenomenon and resulting conceptual confusion is problematic, because it makes it difficult to build upon the work of other researchers.' Although we acknowledge a conceptual difference between OI and collaborative innovation (whereas the more general concept of OI studies a broad range of topics related to opening an organization's innovation practices to all sorts of knowledge exchanges at the edges of the organization, collaborative innovation more specifically investigates collaboration with external parties on these edges), we argue that, both in practice and in the literature, the two concepts are used interchangeably to refer to the same phenomenon.

Different types of OI initiatives can be discerned in the public sector. Some studies have aimed to classify the types of OI initiatives but, in general, this is a topic that has not yet been broadly addressed in the literature. One recently-proposed classification is discussed in Yuan and Gascó-Hernandez (2021), who differentiate between:

- *Crowdsourcing*, which refers to the publishing of an open call, typically enabled by digital platforms, to a large, undefined crowd to solicit ideas, feedback, and content so that many different actors can contribute to solving a complex government task.
- *Challenges and contests*, that are aimed at engaging external, professional stakeholders in the problem-solving, solution design, and policy implementation processes. It entails a problem-solving process to identify a solution to a particular problem or to reward contestants for accomplishing a goal.

- *Civic hackathons*, that involve the use of open government datasets to design innovative digital applications. By presenting open data as an entrepreneurial carrot, public organizations aim to stimulate the development of applications that solve public problems.

Almirall, Lee, and Majchrzak (2014) have argued for distinguishing approaches to OI from the spaces where these approaches are deployed. Indeed, OI can occur in diverse places and at various levels in the public sector. For example, smart cities are using innovation labs, living labs, and other purposefully-designed settings to host OI. They are used as safe spaces for opening up and enabling multi-actor collaboration.

3. An Economic, Strategic, and Relational Perspective on Organizations

This section discusses the main tenets of the theories that we have used to classify the determinants of OI adoption identified in the literature. Each theory offers a distinct perspective on OI adoption: an economic perspective (transaction cost theory), a strategic perspective (resource-based theory), and a relational perspective (institutional theory).

Transaction cost theory takes as its basic unit of analysis the transaction, defined as the transfer of goods and services between different economic actors (Williamson 1981). Transaction costs are seen as the result of frictions in the economic system when such transfers take place (Williamson 1998), and differ on three dimensions: asset specificity (the degree to which the transaction is supported by transaction-specific assets), frequency (the degree to which the transaction is of a recurring kind), and uncertainty (the extent to which the transaction is impacted by uncertainty from the transacting parties' behaviour or the environment). Economizing transaction costs is central to the study of organizations under transaction cost theory: organizations attempt to minimize transaction costs in selecting an appropriate governance mode for a

transaction (Williamson 2002; 1981). Transaction cost theory offers an economic perspective on organizations that '[examines] the coordination and governance of economic agents in their transactions with one another' (Cheon, Grover, and Teng 1995). As OI adoption involves decisions on the governance mode of exchanges, transaction cost theory focuses on the characteristics of the exchanges to understand adoption (Watjatrakul 2005).

Resource-based theory defines an organization as a bundle of productive resources (Barney 1991). Centred on the assumption that resources are heterogeneously distributed and imperfectly mobile across organizations, resource-based theorists posit that the rational choices of organizations are shaped by the resources context (Grant 1991). Resources are defined as 'all assets, capabilities, organizational processes, [organization] attributes, information, knowledge, etc. controlled by [an organization] that enable the [organization] to conceive of and implement strategies that improve its efficiency and effectiveness' (Barney 1991), and can broadly be categorized as: tangible assets (that have a physical or financial embodiment), intangible assets (that have a non-physical or non-financial embodiment), and capabilities (that enable the organization to choose, develop, implement, and realize strategies) (Galbreath 2005). Resource-based theory offers a strategic perspective that is 'concerned with how [organizations] formulate and implement strategies in order to accomplish a desired performance goal' (Cheon, Grover, and Teng 1995). As public organizations operate with constraints on the resources that can be mobilized for OI, resource-based theory focuses on the resources decisions that impact OI adoption (Barney 2001).

Institutional theory posits that the motives of organizations extend beyond economic optimization to social justification and social obligation to external pressures (Scott 2014; DiMaggio and Powell 1983). The theory's central tenet is that

organizations operate within a social framework of norms, values, and assumptions of what constitutes appropriate behaviour, and that organizations feel pressured to conform to these shared notions since violating them may call into question the organization's legitimacy (Oliver 1997). Institutional scholars recognize three dimensions of social pressures: coercive pressures (that originate from more powerful organizations on which the focal organization depends), normative pressures (that arise from the sharing of norms about legitimate behaviour through networks, often associated with professionalisation), and mimetic pressures (that result from other organizations that occupy a similar economic network position and are perceived to be successful) (DiMaggio and Powell 1983). Institutional theory offers a relational perspective that is especially pertinent for public organizations as their political, economic, and social existence depends on satisfying key stakeholders (Bryson, Ackermann, and Eden 2007). Consequently, the adoption of OI in public organizations is 'embedded in institutional arenas of interaction that […] provide rules, norms, routines, cognitive scripts, and discourses' (Sørensen and Torfing 2011).

4. Research Design

4.1.Search Strategies

To ensure that we included a broad range of scientific output, three strategies were used to identify relevant articles. First, we carried out an electronic search in the Web of Science database as it covers a wide range of quality journals in the social sciences domain. In the titles, abstracts, and keywords of articles, the terms *['open innovation' OR 'collaborative innovation' OR 'citizen sourcing' OR 'citizen-sourcing' OR 'citizensourcing' OR 'crowdsourcing' OR hackathon* OR 'innovation challenge*' OR 'innovation contest*']* were searched. We opted not to include other search terms that

may be tangentially related to OI or search terms that refer to places where OI approaches may be deployed (e.g. smart cities) to keep the scope of the review focused and manageable. We added the following terms to define the public sector character of OI: *['public sphere' OR 'public sector' OR 'public service' OR 'public administrat*' OR 'public organization*' OR 'public organisation*' OR 'public management' OR government* OR municipal*]*. We did not include specific search terms for determinants to ensure a broad search that also captured articles addressing factors in an indirect manner as opposed to limiting the search only to those articles whose primary focus was on determinants. This was especially important because determinants are seldomly mentioned explicitly in the abstracts of articles but are often implicitly contemplated in the articles' texts (Cinar, Trott, and Simms 2019). This search was last conducted in October 2020 and generated 519 possible studies for inclusion.

Second, we used Google Scholar to search in the full text of articles published in the top-ranking journals and conferences in the domains of e-government, public administration, information systems, and innovation management. These domains were found to be suitable in recognizing the multidisciplinary nature of OI research. The same search strings were used as in the first strategy. This search was last conducted in October 2020 and generated 1721 possible studies for inclusion.

Third, we analysed books on OI in the public sector. We searched in Google Books for relevant books or book chapters. This search was last conducted in October 2020 and generated 391 possible records for inclusion.

4.2.Eligibility Criteria

Studies identified in our searches were included in the review if they met all of the following criteria:

- *Field:* Articles should study OI in public organizations. We define the public sector in accordance with the OECD as '[comprising] the general government sector plus all public corporations including the central bank'. Articles researching OI in other sectors, such as private companies, were excluded.
- *Topic:* Articles needed to adequately emphasize determinants that impact the adoption of OI to contribute sufficiently to an understanding of its determinants. This means that articles were either directly researching specific determinants (e.g. Smith, Sochor, and Karlsson 2019), or were primarily focusing on other aspects of OI but included substantial discussion on factors that influenced adoption (e.g. Chan 2013).
- *Study design:* All research designs were allowed but systematic reviews were excluded to avoid including studies twice. Empirical studies were included to synthesize the empirically-validated evidence. We also included conceptual studies (e.g. Sørensen and Torfing 2011) to capture scholarly insights about OI determinants.
- *Language:* Only articles written in English were included.
- *Year of publication:* Studies were retrieved that were published in the period from January 1984 to October 2020.
- *Publication status:* We included internationally peer-reviewed journal articles and book chapters from well-established publishers. We also included conference proceedings because OI in the public sector is an emerging research domain.

4.3.Review Method

Articles were screened in two steps. In a first step, the articles' titles, abstracts, and

keywords were screened against the eligibility criteria of *field; study design; language; year; publication status* to perform an initial filtering. Duplicates were removed in this step. Next, the full text of the remaining articles was screened against the eligibility criteria of *topic* to determine if the article provided details on determinants of OI adoption. This screening eventually led to the inclusion of 55 publications. The study's selection process is presented in Figure 1.

[Insert Figure 1 about here]

For each publication included in the review, the following data were extracted: author(s); publication year; title; journal or conference; research design; country; determinants related to adoption. In reading through the publications, we especially sought to identify text fragments where the authors referred to determinants that influence the adoption of OI. The corresponding text fragments were placed in an Excel database, and for each text fragment we determined whether the factor contributed to or hindered adoption.

Next, we categorized and clustered the determinants based on the three theoretical perspectives used in this study following a three-step process (see Appendix 1). First, we allocated each factor to a theoretical perspective by determining to which of the theories' central concepts it pertained: a change in 'transaction costs' for transaction cost theory, 'strategic resources' for resource-based theory, or 'institutional pressures' for institutional theory. We followed the descriptions of the theories in Section 3 as a basis for coding the factors. Second, within each theoretical perspective, we subdivided the determinants along different dimensions of the theory's central concept. These dimensions have been defined by leading scholars in the theories' domains and capture complementary aspects of transaction costs, strategic resources,

and institutional pressures. Third, within each dimension, we screened for overlapping determinants to iteratively cluster the factors into categories.

In an additional step, we also aimed at labelling each article according to the classification scheme proposed by Yuan and Gascó-Hernandez (2021), as outlined in Section 2. Articles received multiple labels if their content corresponded with more than one category. As OI is still an emerging concept with no clear agreement on its constituent approaches, we added a fourth category – 'OI in general' – to account for articles that did not contain any particular discussion pertaining to one of the three categories.

The studies were independently coded by the first author to ensure coding consistency (Saldaña 2015), with the labels and clustering efforts frequently discussed among the researchers. To safeguard the quality of the review, the researchers discussed difficult text fragments by video conference. During this process, new labels were introduced for some factors and others deleted. We acknowledge that such coding is inherently subjective and that not all factors can always be clearly delineated. Nevertheless, this approach is commonly used in systematic reviews (Cinar, Trott, and Simms 2019; De Vries, Tummers, and Bekkers 2018).

5. Results

5.1.Reviewed Studies' Characteristics

Most of the studies examined OI through case studies (35; 64%), adopting a single (20) or multiple (15) case study approach. These case studies often relied on qualitative data, although 3 studies used a mixed methods approach. Our sample also contains a number of articles that can be classified as conceptual (13; 24%) or action research (5; 9%). Only 2 studies (4%) used a quantitative approach with data collected through survey

research.

Although the earliest publication included in our review is from 2010 (Bommert 2010), the majority of studies (34; 62%) were published over the period 2017-2020, underscoring the field's emerging nature. Most of the publications are journal articles (41; 73%), followed by conference articles (10; 18%) and book chapters (4; 7%). Articles have been published in 18 different journals, with 4 journals providing most coverage: Public Management Review (10); Government Information Quarterly (10); Information Polity (3); California Management Review (3). The majority of articles adopted a North-American or European perspective, with only 5 studies focusing on other countries (Australia; Singapore; China; Zambia).

Many articles include discussions pertaining to one or more types of OI: 'civic hackathons' (12 articles), 'crowdsourcing' (20 articles), 'challenges & contests' (12 articles). In 29 articles of the researched set, approaches other than those proposed by Yuan and Gascó-Hernandez (2021) were discussed. Examples include intergovernmental collaboration in the setup of an e-residency project (Kattel, Lember, and Tõnurist 2020), public and non-public actors jointly developing a digital platform (Baka 2017), and the opening of internal IT services and data to partner organizations for innovation purposes (Danneels and Viaene 2018).

5.2.Determinants of OI Adoption

This section presents a discussion of the determinants of OI adoption in public organizations, structured according to the three theoretical perspectives outlined in Section 3 of this article.

5.2.1. Transaction Cost Perspective

In total, 23 (42%) studies discuss determinants that relate to a transaction cost

perspective. Articles in our review have focused on the uncertainty dimension.

Uncertainty. The sampled literature discusses three uncertainty-related determinants: intermediaries; inter-actor trust; and standardized processes across public organizations.

A first determinant, identified in 17 articles, are intermediaries, defined as 'organizations that intermediate between local/regional/national governments and other organizations and individuals with the purpose of enhancing public sector innovation capacity by means of applying open innovation methodologies' (Gasco-Hernandez, Sandoval-Almazan, and Gil-Garcia 2017). They take on the role of boundary spanner, helping to bridge the gap between public organizations and external innovators (Howells 2006). The literature suggests that intermediaries can be a catalyst for the opening of public innovation processes as they absorb uncertainty related to OI in several ways.

A number of studies find that intermediaries facilitate OI by acting as a knowledge broker that enables links between the public organization and a network of 'actors with different backgrounds, vocabularies and interests' (Torfing 2016). Intermediaries offer a harmonized access point to a heterogenous group of external innovators and help to resolve tensions that arise as a result of the cognitive distance between these previously disconnected groups (Smith and Akram 2017; Bakici, Almirall, and Wareham 2013; Bharosa and Janssen 2020; Crivellari 2019; Chatfield and Reddick 2018). For example, during Chicago City's efforts to collaboratively develop a food inspection forecasting model, an intermediary connected the city with external innovators and took on the role of project manager to prevent conflicts between parties (McBride et al. 2019).

Moreover, some public organizations choose to outsource OI to an intermediary because they ‘do not internally hold all the needed capabilities or manpower to prepare their organizations for such practices’ (Smith and Akram 2017). Intermediaries then take up the role of OI specialist, superseding the public organization’s lack of experience, capacity, or willingness (Almirall, Lee, and Majchrzak 2014). Rather than discussing outsourcing of the entire OI activity, most articles found in the literature speak about the transfer of specific tasks to an intermediary, such as formulating strategy and vision (Snow, Håkonsson, and Obel 2016), developing technological infrastructure (Smith and Akram 2017), or promoting the initiative (Hennala, Parjanen, and Uotila 2011; Mergel and Desouza 2013).

In many studies, intermediaries go beyond the role of middlemen by providing training to the public organization. Training enables the public organization to learn how to open its innovation processes and to develop the necessary process capabilities to run and manage OI (Mergel 2018). Training, in the sampled articles, has focused on a range of topics, such as the legalities of OI, working with new technological tools, and collaborating with partners (Hennala, Parjanen, and Uotila 2011; Gascó 2017). Additionally, in a number of studies, the intermediary also provided training on the value of external collaboration to increase awareness and convince public organizations to adopt OI methods (Snow, Håkonsson, and Obel 2016).

Importantly, several authors point to the complexities of working with intermediaries. Potential issues include misalignment of expectations between the intermediary and the public organization, bureaucracy, budget restrictions, and governance problems (Bakici, Almirall, and Wareham 2013; Almirall, Lee, and Majchrzak 2014; Gascó 2017).

A second determinant, identified in 8 studies, is inter-actor trust, defined as 'the stable expectation that other actors will refrain from opportunistic behavior when the opportunity occurs' (Torfing 2016). In a survey of Spanish municipalities, Barrutia and Echebarria (2019) find a significant positive relationship between inter-actor trust and the use of OI methods in municipalities, suggesting empirical support for Torfing's (2016) proposition that 'trust [is] important in lowering transaction costs, facilitating the exchange of knowledge, and pooling resources and ideas.' In contrast, a Swedish open mobility project was confronted with lengthy and complex contract negotiations as a result of a lack of trust between actors (Smith, Sochor, and Karlsson 2019). Articles in our sample have suggested different factors that can influence inter-actor trust, such as: partners that have a similar belief that collaboration will create public value; public organizations that are not in competition with each other; and the absence of predatory actors that may exploit the collaborative process to their own advantage (Kattel, Lember, and Tõnurist 2020; Klievink, van der Voort, and Veeneman 2018).

For a third determinant, 3 articles found that standardizing OI processes across multiple public organizations makes it easier for other organizations to jump on the bandwagon (van Winden and Carvalho 2019). Standardization reduces uncertainty regarding the new way of innovating in that it signals that potential barriers have already been dealt with, as was observed by Mergel (2018) for the United States Challenge.gov initiative: 'A central [standardized] approach to solving the technological problems for all participants has encouraged agencies to use the platform knowing that legal barriers regarding the review of the Paperwork Reduction Act were already prescreened and preapproved.'

5.2.2. Resource-Based Perspective

In the sampled literature, 47 (86%) studies explore determinants that relate to a

resource-based perspective on organizations. They underscore the need for mobilizing different resources for OI adoption.

Tangible assets. Tangible assets that shape OI adoption were identified in 23 (42%) studies in our sample and can generally be grouped into two categories: technological resources and financial resources.

First, 18 studies recognize the potential of information and communication technologies (ICT) in connecting and collaborating with external innovators as technology will influence 'who is involved, how they interact with each other, how the interactions are structured and what behaviours or actions emerge' (Kattel, Lember, and Tõnurist 2020). The role of ICT has been described as 'critical' (Nam 2012), 'key enabler' (Millard 2018), and 'of major significance' (Charalabidis et al. 2016). The argument is that technological progress has created an environment in which public organizations can engage in ICT-enabled forms of organizing innovation that were previously inaccessible (Loukis, Charalabidis, and Androutsopoulou 2017; Gagliardi et al. 2017). For example, Nam (2012) argues that public organizations should view technology '[as] a tool, not a strategy' for OI, and posits that different technologies enable different strategies to tap into the wisdom of crowds. Examples of ICT-enabled opportunities for OI in the literature are diverse, such as: online platforms to broadcast innovation challenges (Lifshitz-Assaf 2018; Mergel 2018); open application development through open web services (Charalabidis et al. 2016; Danneels and Viaene 2018; Mergel 2015); and open data used in hackathons (Millard 2018; Chan 2013; Välja and Ladhe 2015).

Second, the influence of financial resources on OI adoption was recognized in 8 studies. Hartley, Sørensen, and Torfing (2013) note that financial constraints strengthen the demand for fail-safe administrations, underscoring the limited budgetary

manoeuvrability of many public organizations to experiment with OI. Collm and Schedler (2011) find that the introduction of crowdsourcing in six German cities was associated with additional expenses and higher costs. These findings are in line with observations in federal administrations in the U.S. and Belgium, where additional financial resources covered for the provision of dedicated personnel and prize money for the winning solutions (Mergel 2018; Van Dijck, Steen, and Verhoest 2018). Three studies in our sample mention the use of external funding mechanisms in support of OI: philanthropy (McBride et al. 2019), venture capital (Almirall, Lee, and Majchrzak 2014), and private company funding (Carr and Lassiter 2017).

Intangible assets. Intangible assets that influence OI adoption have been discussed in 28 (51%) studies, from which we identified the following determinants: public managers and leaders, organizational structure, organizational culture and professional identity, and strategic alignment.

First, 16 studies discuss the role of public managers as initiators of OI. In studying crowdsourcing in Australian local governments, Randhawa, Wilden, and West (2019) find that an important first step in the adoption process is securing management commitment, arguing that their buy-in is needed for mobilizing resources for OI in the organization. Similarly, Zhang et al. (2017) report on the rise of OI in a Chinese city that was largely due to a local department head who started the initiative and promoted it within the city administration. However, other studies have warned against a managerial push for OI that is too forceful in that it may fail to convince public employees to participate (Lindsay et al. 2018; Hennala, Parjanen, and Uotila 2011). Others have cautioned against an over-simplistic reliance on heroic public managers to initiate OI (Crosby, ‘t Hart, and Torfing 2017).

To resolve such tensions, several authors emphasize the notion of leadership (Hartley, Sørensen, and Torfing 2013; Lindsay et al. 2018; Torfing 2013), underscoring a shift from 'traditional forms of strong and resilient leadership based on command, regulation, and control' towards 'leadership and management that is more distributive, horizontal, collaborative, and integrative' (Torfing 2016). The authors argue that because public innovation is seldomly the result of individual actors, public managers, in their capacity as leaders, should rather play an active role in facilitating OI processes. McBride et al. (2019) provide an empirical example, concluding that although a city manager in Chicago initially did not understand the aim of the OI initiative, she actively participated and eventually played a critical role in enabling its success by playing more of a facilitating rather than managing role.

Second, 13 studies have discussed organizational structure as a determinant of OI adoption, recognizing that traditionally 'the public sector is compartmentalized in bureaucratic silos that […] spend more and more time and resources on internal coordination' (Torfing 2019). The sampled literature suggests a careful balancing act of organizing OI to allow adequate flexibility for the initiative to flourish but simultaneously ensure that it does not become disconnected from the existing organization (Collm and Schedler 2014; Torfing 2016). Initiatives reported in the literature have approached the issue in different ways. In some studies, the introduction of OI required a reformulation of existing roles and responsibilities (Hartley, Sørensen, and Torfing 2013). These efforts often proved to be challenging (Smith, Sochor, and Karlsson 2019; Mergel and Desouza 2013; Mergel 2018). Conversely, Collm and Schedler (2014) argue from the experiences of a Swiss city that defining new roles and responsibilities reduced complexity as it allowed to assign different levels of accountability to specific individuals.

Some reported OI initiatives were housed in an entity outside the existing organizational structures, with the idea of 'creat[ing] a safe, neutral, collaborative space, unconstrained by organizational politics' (Tate et al. 2018; Chesbrough and Di Minin 2014), thereby sidestepping well-established power structures in the organization (Snow, Håkonsson, and Obel 2016; Cohen, Almirall, and Chesbrough 2016; Zhang et al. 2017).

Third, in 12 articles, the literature referred to a hierarchical culture at public organizations, that affirms uniformity, coordination, and a close adherence to rules. However, as OI often relies on loosely-structured innovation processes (Collm and Schedler 2014), a hierarchical culture may result in a number of adverse effects, including: not-invented-here syndrome, risk averseness, and fear of losing control (Smith, Sochor, and Karlsson 2019; Mergel 2018; Neumann et al. 2019; Aschhoff 2018; Ahn et al. 2019). Three articles have directly explored how public organizations tackled culture to enable experimentation with OI, emphasizing the role of carefully-crafted, positive discourses to create cultural resonance of OI in the organizations, including attention to semantics, positive connotations, and storytelling (Agger and Sørensen 2018; Heimstädt and Reischauer 2019).

Torfing (2019) argues that the scholarly debate should include professional identity-related considerations, focusing on how public employees perceive and articulate their professional role in the organization. Members of public organizations have to refocus their professional working identity to successfully engage in OI processes: public employees should not consider themselves as bureaucratic rule-followers but rather adopt a more entrepreneurial role. However, this shift in identities 'will be neither spontaneous, swift nor simultaneous' (Torfing 2019). Indeed, Lifshitz-Assaf (2018) finds that the introduction of OI in the United States space agency NASA

created an identity conflict for many public employees, challenging their professional identity as expert problem solvers. Using longitudinal case study data, she found that only those public employees that purposefully lowered their knowledge boundaries and refocused their identities embraced the OI paradigm.

Fourth, 8 articles argued that OI initiatives benefit from aligning with the organization's strategy. For instance, Snow, Håkonsson, and Obel (2016) observe how the adoption of an OI model in a Danish city secured a foothold by purposefully linking to the city's strategy, enabling the OI initiative to leverage existing resources and reputational gains. Similar observations have been made for the U.S. Challenge.gov programme (Mergel 2018) and a Chinese city's social media efforts (Zhang et al. 2017). In contrast, three articles found that in the absence of a supporting organization strategy, OI risks being viewed as peripheral (Almirall, Lee, and Majchrzak 2014), leading to low prioritization, which, in turn, hampers access to the organization's resources (Smith, Sochor, and Karlsson 2019) and prevents the allocation of sufficient time (Van Dijck, Steen, and Verhoest 2018).

Capabilities. Twenty-five (46%) studies in our sample touched on capabilities that public organizations need to develop for OI. The capabilities identified in the literature are: explore, codify, and transfer innovation needs, manage external innovators' involvement, act as meta-governor, agile development methodology.

First, public organizations need capabilities to explore, codify, and transfer their innovation needs to external innovators, as identified in 7 articles. For example, crowdsourcing requires the innovation needs to be published as open calls that are 'not only closed ended enough to make them understandable to amateur problem solvers, but also open ended enough to allow for innovations the agency has not thought about itself' (Mergel 2018). Thus, to adopt OI, public organizations need to be able to identify

and communicate their innovation needs to external actors. While studying collaborative innovation, Torfing (2016) suggests that a closer acquaintance with design thinking can help public organizations by reframing problems and questioning assumptions.

Second, 16 studies discuss capabilities to manage external innovators' involvement. A first step is to identify and understand the diverse motivations of external actors to participate in public innovation (Thapa et al. 2015; Almirall, Lee, and Majchrzak 2014). This may involve a significant learning curve for public organizations as OI is often aimed at collaborating with non-traditional actors that do not have a privileged position in public innovation (Aschhoff 2018; Carr and Lassiter 2017). Next, public organizations need to carefully manage this diversity of motivations, which can range from awarding prize money to designing business models that provide sufficient value for innovation partners (Smith, Sochor, and Karlsson 2019; Klievink, van der Voort, and Veeneman 2018). Moreover, public organizations need to manage the collaboration process. To address this need, the literature suggests paying attention to the dramaturgical context of interactions (Torfing 2016), the degree of involvement of different actors (Barrutia and Echebarria 2019), effective communication between partners (McBride et al. 2019; Neumann et al. 2019), and the development of appropriate sanction mechanisms (Aschhoff 2018).

Third, in 6 articles, scholars view OI as instantiations of governance networks and emphasize that public organizations should adopt the role of 'meta-governor' (Sørensen and Torfing 2011), which 'involves an extensive use of soft forms of power that commit actors to engage in collaborative innovation processes without directly forcing them to do so and to align collaborative governance with large-scale governance aspirations' (Agger and Sørensen 2018). The authors argue that public organizations

should regulate the OI network by exercising power in subtle and indirect ways, for example by shaping the negotiation arenas and mediating conflicts (Sørensen and Torfing 2017; Visnjic et al. 2016).

Fourth, three articles emphasize capabilities to coordinate the application of innovation resources through an agile development methodology. For example, Tate et al. (2018) describe the development of a sprint methodology for open service innovation in Australian local and national governments, focused on incremental and rapid development, release of a minimum viable product, and validated learning.

5.2.3. Institutional Perspective

A number of determinants in the literature can be linked to an institutional perspective on organizations, capturing social pressures exerted on public organizations. Institutional factors were reported in 23 (42%) studies.

Coercive pressures. The most common type of institutional pressure identified in the literature is coercive pressure that is exerted by institutions upon which public organizations are dependent. Coercive pressures were identified in 19 (35%) studies, broadly originating from two sources: political entities and legislation.

A first group of pressures, discussed in 15 articles, emanate from institutions in the political domain. A number of scholars have found that political entities impose formal mandates on public organizations to experiment with OI. For example, Heimstädt and Reischauer (2019) and Carr and Lassiter (2017) find that New York City's mayor leveraged his prior experience as technology entrepreneur to pilot a number of initiatives in the city agencies. Similar coercive pressures from politicians have been identified in U.S. federal agencies (Mergel 2018; Mergel et al. 2014; Nam 2012) and several European cities (Snow, Håkonsson, and Obel 2016; Collm and

Schedler 2011). Authors suggest that OI adoption is the result of public managers that align their organizations with policy agendas.

In a number of sampled studies, political entities were found to deter rather than enable OI adoption. Further empirical investigations have found that politicians restrict public organizations' manoeuvrability by giving public managers too little discretionary power (Collm and Schedler 2011), not approving necessary funding (Bakici, Almirall, and Wareham 2013), or by imposing bureaucratic processes (Baka 2017; Neumann et al. 2019). Hartley, Sørensen, and Torfing (2013) argue that politicians may block efforts in certain policy areas because the involvement of external actors can jeopardize public security, compromise privacy, or harm the interests of public organizations.

A second source of coercive pressures, identified in 5 articles, originates from legislation. Scholars generally characterize legislation's effect in two ways: existing rules that are too restrictive, and the absence of a supportive legislative framework.

Existing regulations have been identified to hamper OI efforts because they restrict interactions with the public (Mergel and Desouza 2013). For example, when developing an open mobility project, a Swedish public authority's action space was limited by legislation: 'under current legal circumstances [the public transport authority] cannot take any other role in the emerging ecosystem than the role as provider of traditional [public transport]. Other roles would imply that they were moving outside the domain in which they are allowed to work.' (Smith, Sochor, and Karlsson 2019) In other words, legislation may narrowly define the responsibilities of public organizations, limiting their manoeuvrability. Moreover, legislation may provide ill-fitting vehicles for OI. One vehicle with recurring mentions in the literature is public procurement, often presented as a rigid instrument that is incompatible with the degrees

of freedom required for OI (van Winden and Carvalho 2019; Mergel and Desouza 2013).

Apart from existing laws that hamper OI, a number of studies mention the absence of a legal framework that supports public organizations in experimenting with OI. Legal ambiguity arises with regards to topics such as privacy provisions, GDPR compliance, and intellectual property rights (Diamantopoulou et al. 2018; Mergel 2018).

Normative pressures. Nine (16%) studies relate to normative pressures. These pressures originate from the broader social environments in which public organizations operate. The social environments, ranging from local communities to country-wide social systems, shape collective expectations of what constitutes appropriate innovation strategies in public organizations. The studies describe OI adoption as a response to technological or behavioural trends in society towards a more open public sector (Zhang et al. 2017; Kattel, Lember, and Tõnurist 2020; Mergel 2018), in an effort to make public organizations look cool and 'to simply demonstrate "we're doing it too"' (Nam 2012), or to follow country-wide traditions of involving stakeholders in decision-making processes (Snow, Håkonsson, and Obel 2016; Torfing 2016). However, some studies indicate that normative pressures may be tempered by public organizations' concerns that OI could be perceived by the public as resulting in a loss of accountability by shifting away from established innovation practices (Mergel 2018; Mergel and Desouza 2013).

Mimetic pressures. Only one (2%) study in our review reports mimetic pressures as a determinant of OI adoption. Mergel (2018) argues from the experiences in the U.S. Challenge.gov initiative: 'Agencies that are adopting prizes and challenges slower than others reported that they tend to mimic already existing behaviour from agencies that were able to jump onto the bandwagon earlier.'

6. Discussion

In this article we have reviewed the OI literature to explore the determinants of OI adoption in public organizations. Identifying, classifying, and understanding these determinants is important to succeed in the shift from closed to open innovation models.

Our findings show that the adoption of OI in public organizations is a complex, multifaceted issue that is the result of a compounding of intra-, inter-, and extra-organizational determinants. Our review finds that a resource-based rationale is dominant in the literature, focussing on the need to mobilize resources for OI adoption. The prevalence of resource-based theory in our results is consistent with the theory implicitly being one of the dominant approaches to strategy research in the public sector (Bryson, Ackermann, and Eden 2007). The diversity of resources identified in the literature confirms propositions from a number of researchers (e.g. Mergel 2018; Millard 2018) that OI encompasses not only technological changes but also has important organizational implications. Along these lines, this review underscored the importance of resources such as facilitating and integrative leadership, and collaborative capabilities.

Although transaction cost considerations and institutional pressures have received less attention in the OI literature, the determinants uncovered in this review may be more representative of prior research choices than of the empirical reality. Thus, we are unable to assess whether transaction cost and institutional determinants are less prevalent in reality, or whether this represents a lack of research interest. We suspect the latter.

6.1. Towards a Synthesizing Framework of OI Adoption

Drawing on our findings and the theoretical perspectives used in this study, we propose

a synthesizing, theoretically-grounded framework of OI adoption in Figure 2. In line with the philosophical roots of the theoretical lenses, the framework incorporates three categories of determinants that are economic, strategic, and relational in nature. The combination of the perspectives provides complementary views on determinants of OI adoption in the public sector. The determinants influence OI adoption directly, and, in addition, the framework proposes that they also influence each other.

[Insert Figure 2 about here]

Starting from an institutional perspective, the framework recognizes the institutional arenas in which public organizations are embedded and that influence the way the organization looks at and approaches OI. Our review identified pressures from political and regulatory institutions, normative pressures from the social environment, and mimetic pressures from comparable public organizations as determinants of OI adoption.

According to a resource-based perspective, a public organization needs to mobilize diverse tangible and intangible assets and develop capabilities to adopt OI. Examples include the development of a digital platform to connect with outside innovators (e.g. Lifshitz-Assaf 2018), or capabilities to identify, codify and communicate innovation needs to external actors (e.g. Thapa et al. 2015).

The transaction cost perspective suggests that OI adoption is also influenced by the characteristics of transactional interactions. In line with this view, the framework recognizes the facilitating influence of intermediaries, the importance of inter-actor trust, and the degree of standardization across organizations as determinants of OI adoption.

In addition, the framework acknowledges relationships between determinants. As public organizations are not passive observers of their institutional environment but

actively contribute to its development, a relationship between institutional and resource-based determinants is incorporated. This recognizes that, through their actions, public organizations influence the institutional environment in which they are embedded, whether they 'circumnavigate and stretch the entrenched institutional commitments and routines of government – or [they] openly challenge and change them.' (Crosby, 't Hart and Torfing 2017). In addition, following Liang et al. (2007), this relationship suggests that for institutional pressures to take effect on OI adoption, they may first need to be translated into the mobilization of resources in public organizations. Along the same lines, the framework incorporates a relationship between transactional and institutional determinants as other actors in the transactional arena, such as citizens and companies, will themselves be influenced by institutional pressures of what constitutes acceptable behaviour, and concurrently shape these pressures by conforming to, actively trying to alter, or evading them.

Lastly, the framework proposes a relationship between transactional and resource-based determinants, encapsulating that 'transaction costs themselves are not fully exogenous; their magnitude depends on the conscious actions undertaken by [organizations]' (Jacobindes and Winter 2005). In specific, transaction costs are subject to attempts of public organizations to shape the transactional environment to their advantage via the strategic mobilization of resources (Mayer and Salomon 2006). For example, a public organization may cultivate an agile development capability to decrease the resource-intensity of development sprints and be less dependent on inter-actor trust to counter opportunistic behaviour.

The resulting framework of OI adoption in Figure 2 should be viewed as part of an extended scholarly effort to understand the adoption of OI in public organizations. Our conceptualization, incorporating economic, strategic, and relational elements, is in

line with the evolution of research on e-government adoption, that has broadened from a focus on technological and operational topics to increasingly include factors external to the adopting organization (Savoldelli, Codagnone, and Misuraca 2014; Meijer 2015).

6.2.Exploring Differences Across OI Approaches

In this section, we explore differences in determinants across OI approaches using the classification proposed by Yuan and Gascó-Hernandez (2021).

From a resource-based perspective, the results suggest that financial resources may be less influential in the adoption of challenges & contests. Instead, references to the lack of financial resources constraining adoption are concentrated in articles discussing other approaches. Possibly, this result can be explained because the associated prizes and rewards do not need to be monetary. This is consistent with Mergel and Desouza's (2013) study of Challenge.gov finding that 'financial recognition was of limited interest to the winners.' However, incentive design for challenges and contests is still an often-overlooked topic as capabilities related to identifying appropriate incentives were discussed in only two articles.

Furthermore, our review finds that governance-related capabilities are concentrated in articles that focus more generally on OI, suggesting that the influence on the adoption of civic hackathons, crowdsourcing, and contests in public organizations is not yet well-understood. Specifically, the notion of meta-governance in an OI context (Torfing 2016) is largely a theoretical concept, of which the implications on the adoption of various OI approaches in an empirical context is still unclear.

From a transaction-costs perspective, we find indications that the role of intermediaries as knowledge broker differs based on the OI approach. In studies about crowdsourcing and challenges & contests, intermediaries mostly intervened as providers of technological platforms facilitating matchmaking. For example, in Lifshitz-Assaf

(2018), NASA relied on InnoCentive to broadcast its challenges online but afterwards the relationship with external innovators remained largely at-arms-length. In other approaches, however, the role of an intermediary went deeper and broader. During the collaborative development of a forecasting model in McBride et al. (2019), the intermediary also took on responsibilities such as conflict mediation and resolution. Importantly, however, the alignment issues when working with intermediaries were typically associated with intermediary roles going beyond technology platform provider (e.g. Bakici, Almirall, and Wareham 2013).

Inter-actor trust has primarily been discussed in articles focussing on other approaches than those discussed by Yuan and Gascó-Hernandez (2021). Moreover, our review identified no articles discussing trust as a determinant of adoption in the context of civic hackathons. A possible explanation might be that because hackathons tend to be well-structured, time-limited events (Johnson and Robinson 2014), trust would be less of an important condition to facilitate engagement with external innovators.

With regards to institutional pressures to adopt OI, we find little variance between categories. Rather, the results show that coercive and normative pressures are equally distributed across OI categories, suggesting similar institutional influences. As mimetic pressures were only identified in one article, focused on challenges and contests, the results are insufficient to establish meaningful differences.

6.3.Suggestions for Future Research

Based on the findings, we propose several avenues for future research to expand the framework of OI adoption and theoretical perspectives, and to stimulate methodological diversity.

First, as the literature is still in a state of development, additional research is needed to complement the review's findings and explore other determinants. Notably,

certain dimensions of the theoretical perspectives used in this study have received little attention but are suggested by the respective theories as important factors to explain organizational behaviour. These underexplored dimensions offer opportunities for future research on OI adoption. For example, issues related to asset specificity were not identified in this review but may arise when public organizations transfer responsibilities to intermediaries, creating a threat of hold-up and lock-in effects that may influence OI adoption. Similarly, the influence of mimetic pressures remains an underexplored topic.

Second, future research should unpack the determinants to connect abstract organizational constructs to concrete actions at subjacent levels. For example, following an institutional perspective, future research could explore the micro-sociological processes of how public organizations experience, interpret, and learn to manage the social pressures to adopt OI practices (Heugens and Lander 2009). An alternative direction, consistent with a resource-based perspective, is to explore how different technologies can enable different OI strategies by leveraging, for example, technology affordances theory (Anderson and Robey 2017).

Third, researchers should go beyond the linear relationship that is often assumed between determinants and OI adoption by exploring more complex relations. In much of the literature, determinants are discussed as independent, with possible interactions largely ignored. However, the dynamics that exist between determinants may provide more nuanced insights to mature the knowledge base. For example, the institutional pressures identified in this review constitute external influences on OI adoption, but to take effect they need to be translated into the mobilization of resources in the organization (Liang et al. 2007). This suggests a more complex, time-bound view on adoption.

Fourth, the literature has largely ignored the empirical reality akin to an iterative process of mutual influence between determinants and adoption. For instance, although a risk-averse culture may hamper the adoption of OI, OI practices may contribute to cultural change in public organizations. This notion of co-evolution suggests that the influence of determinants is not static but varies in time and place. To develop a better understanding of OI adoption, it is important that such iterative influences are not simply abstracted away in future studies.

Fifth, although this review has focused on the adoption of OI, future research should also explore assimilation. Once OI has been formally adopted, it has to be assimilated into the organization's processes and routines to realize the expected benefits (Liang et al. 2007). Rather than conceiving organizational use as a simplistic binary choice, assimilation focuses on the breadth and depth of OI's use in the organization. It is important to broaden the scholarly debate to include assimilation as without it OI may enjoy widespread initial adoption but fail to come to fruition in the full acceptance, routinisation, and institutionalization in public organizations (Saraf et al. 2013). During our review we identified only a handful of studies that tangentially touched on assimilation (e.g. Snow, Håkonsson, and Obel 2016). Organizational learning theories may offer a useful analytical lens to explore assimilation in recognizing the substantial burden on public organizations in terms of the knowledge needed to use OI effectively (Fichman and Kemerer 1997).

Finally, from a methodological standpoint, our review shows that qualitative case studies are the preferred research approach. Although qualitative case studies provide rich insights, they have limitations in terms of generalizability. As our understanding of OI matures, this qualitative dominance should be complemented with quantitative, proposition-based research. More explanatory and predictive models can

be tested using quantitative studies, allowing to make statements about the importance and prevalence of certain explanations of OI adoption and to determine the direction of the effect of specific determinants.

7. Conclusion

This article presents a synthesizing framework of determinants of OI adoption in public organizations. As OI in the public sector is still weakly conceptualized, this review strengthens the burgeoning literature on this topic. As much of our current understanding of OI adoption is based on case studies that have focused on only one or a few determinants, the article aggregated the extant knowledge on this topic from diverse research domains. Moreover, we have relied on three organization theories to provide a theoretical foundation to our understanding of OI adoption and advance the scholarly debate beyond descriptive analyses. By combining transaction cost theory, resource-based theory, and institutional theory, the framework incorporates economic, strategic, and relational elements.

In addition to the OI literature, this review also contributes to the scholarly debates on public innovation and co-creation. Prior research in these domains has focused on exploring conditions for public innovation without collaboration (e.g. Cinar, Trott, and Simms 2019), on governance networks without concerns for innovation (e.g. Klijn and Koppenjan 2012), or on the production of public services with citizens as partners (e.g. Voorberg, Bekkers, and Tummers 2015). This article broadens the scholarly debate towards the adoption of OI practices, that open an organization to all sorts of knowledge exchanges at the edges of the organization.

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Appendix 1. Data coding

Theoretical perspective	**Key dimension**	**Definition of key dimension**	**Illustrative example from literature review**
Transaction cost theory	Asset specificity	The degree to which open innovation transactions are supported by transaction-specific assets	Not identified
	Frequency	The degree to which open innovation transactions are of a recurring kind	Not identified
	Uncertainty	The extent to which open innovation transactions are impacted by uncertainty from the transacting parties'	'The interviewees also brought up the hurdle of negotiating contracts. Contractual agreements are always difficult, they said, but that the case of MaaS brings additional difficulties. The contracts would involve a new product with uncertain impact. Moreover, the contracts would be set up between actors that have not previously collaborated, are of

		behaviour or the environment	entirely dissimilar natures, and originate from different traditions, for example global enterprises, PTAs, and local start-ups.' (Smith, Sochor, and Karlsson 2019)
Resource-based theory	Tangible assets	Resources in the form of assets that have a physical or financial embodiment	'The Community Engagement Environment provides a Web 2.0 participative environment that allows the users of the proposed open innovation platform, including citizens, businesses-SMEs, NGOs, and public administrators themselves, to engage in the specification of new personalized services of public value. The forms of engagement will vary as the community of users will be able to record the needs of a new service of public value or even needs for opening specific datasets by public sector providers.' (Charalabidis et al. 2016)
	Intangible assets	Resources in the form of assets that do not have a physical or financial embodiment	'To drive the process from the identification of relevant actors through interaction and collaboration and on to public innovation, leadership and management are urgently needed to remove barriers and drive the process forward. However, we should be careful not to believe that more and better public leadership and management can solve all problems. When it comes to stimulating collaborative and innovative processes, traditional forms of strong and resilient leadership based on command, regulation, and control will be

			counterproductive, and the processes depend on institutional, cultural, and environmental factors that are difficult to affect, at least in the short run.' (Torfing 2016)
	Capabilities	Resources that enable the organization to choose, develop, implement, and realize strategies	'Collaborative innovation requires another capacity, which relates to the transfer of authority or 'decision rights' to determine public value in innovation. Moore and Hartley (2008) argue that external actors will claim decision rights to determine which ideas for public value are generated, selected, implemented and diffused in exchange for their innovation resources. […] Therefore, government cannot completely control the innovation of public value in collaborative innovation and needs to develop norms and methods to decide on the tradeoff between authority and external innovation assets.' (Bommert 2010)
Institutional theory	Coercive pressures	Social pressures that originate from more powerful organizations on which the focal organization depends	'The Town Clerk explained the bureaucratic organizational forms; he referred to the standard procedure that they had to follow and explained that it took three months for the ministry to approve the project. As paradoxical as this sounds and irrespective of the local government's will, the open platform under development had to be formally approved through the hierarchical governmental scheme by the Ministry of Local Government and Housing.' (Baka 2017)

Normative pressures	Social pressures that arise from the sharing of norms about legitimate behaviour through networks, often associated with professionalisation	‘Public managers are picking up general technological or behavioural trends that allow them to rethink their internal needs or existing mechanisms, which might lack opportunities to initiate innovations, or even to reach out to those parts of their stakeholders they usually cannot reach through the existing channels. […] The more experience agencies gain with crowdsourcing mechanisms to engage large amounts of problem solvers, the more they recognize the shift among citizens who want to be in contact with the government.’ (Mergel 2018)
Mimetic pressures	Social pressures that result from other organizations that occupy a similar economic network position and are perceived to be successful	‘Agencies that are adopting prizes and challenges slower than others reported that they tend to mimic already existing behaviour from agencies that were able to jump onto the bandwagon earlier: […] Mimicry does not only flow from the outside in (mimicking NASA’s or GSA’s innovative behaviour), but also within a larger department, public managers copy each other’s behaviour and learning from each other.’ (Mergel 2018)

Figure 1. PRISMA flow diagram

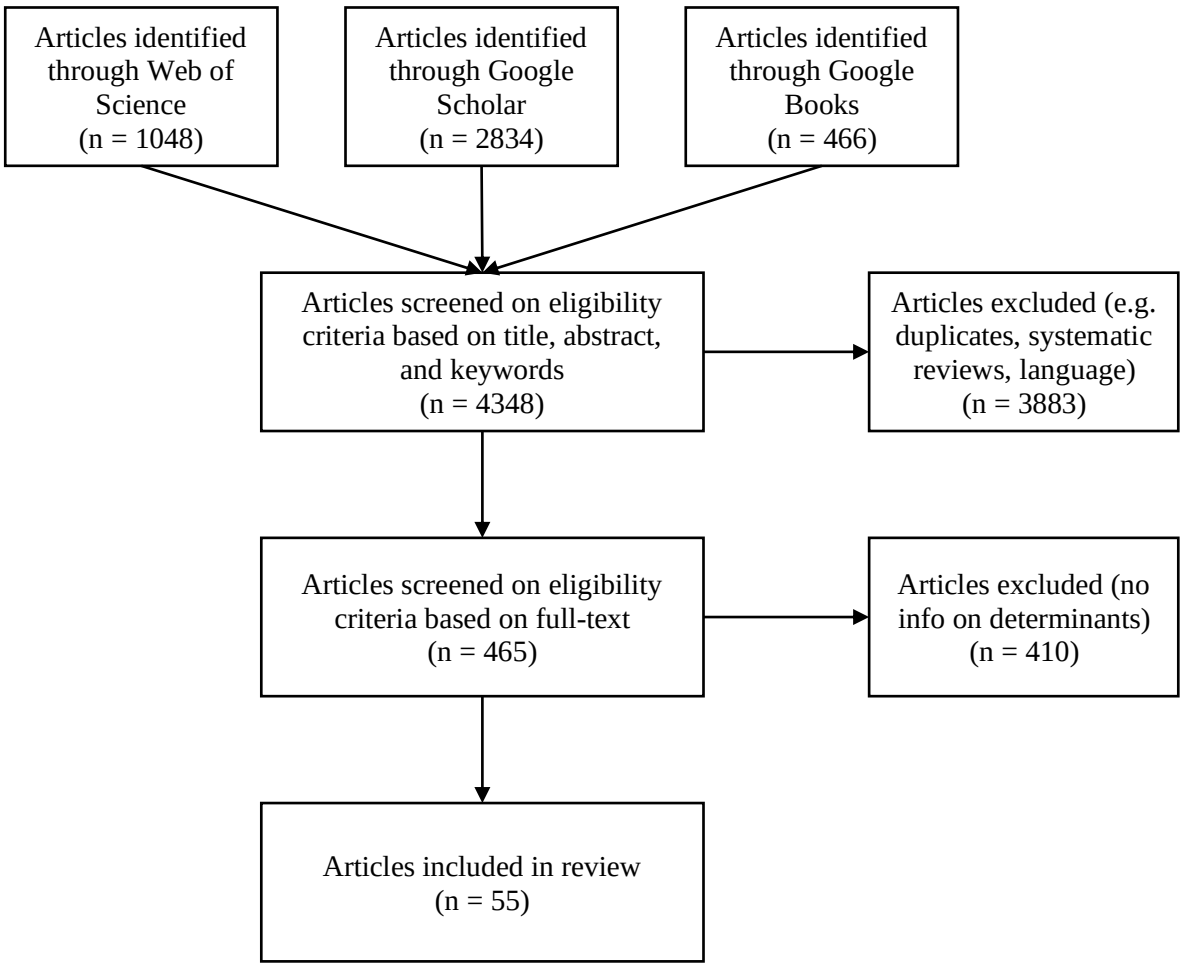

Figure 2. Proposed framework of OI adoption in public organizations