



Innovation in the Public Sector: A Systematic Review and Future Research Agenda

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Abstract

This article consolidates the empirical state-of-the-art on academic research on public sector innovation. Done by the method of a systematic review of the literature (1990-2014), 158 articles and books are analysed, based on the themes of the 1) definition of innovation, 2) innovation types, 3) objectives, 4) influential factors to the innovation process (including the adoption and diffusion stage) and 5) outcomes. Results shows that most studies do not pay attention to the outcomes of the innovation process. Furthermore, more quantitative studies are welcome, given the qualitative dominance in the field. Based upon the systematic review, an overall empirical based model is presented regarding the potential influential factors, types and outcomes of innovation in the public sector. Directions for future research are proposed that address various methodological, theoretical and empirical gaps.

Keywords:

- Systematic review
- Public sector innovation
- Diffusion
- Adoption

1 Introduction

Innovation in the public sector has gained an increased interest from scholars and practitioners (Damanpour et al., 2009; Borins, 2014; Hartley et al., 2013; Brown & Osborne, 2013; Walker, 2014; Osborne & Brown, 2011). Many embrace the idea that innovation can contribute to improve the quality of public services as well as to enhance the problem-solving capacity of governmental organizations to deal with societal challenges (Damanpour & Schneider, 2009; Walker et al., 2011). Very often public sector innovation has been linked to reform movements like New Public Management (Hood, 1991; Politt & Bouckaert, 2011; Windrum & Koch, 2008), electronic government (Bekkers & Homburg, 2005), the change-over from government towards governance (Rhodes, 1996) and, most recently, to discussion about the (retreating) role of government in a 'Big Society' (Lowndes & Pratchett, 2012).

In the private sector innovation studies are an established field of study and theory-building that tries to explain why and how innovation takes places (Fagerberg et al., 2005). General literature reviews and meta-analysis have been carried out to understand what the state-of-the-art of the field is (Mueller et al., 2013; Perks & Roberts, 2013; Slater et al., 2014). But what do we know about public sector innovation? How evidence-based is our knowledge about public sector innovation?

In public administration, various literature reviews have been conducted during the last years, mostly grasping the meaning and importance of public sector innovation conceptually, rather than empirically (examples are Osborne & Brown, 2011; Brown & Osborne, 2013). Others describe the literature using a normative approach (for instance Bason, 2010). However, systematic reviews, which analyse a body of knowledge in a transparent and reproducible way, are scarce. But there are exceptions. For instance, Walker (2014) analysed the internal and external antecedents of process innovations in UK local government. However, a more general and systematic review about public sector innovations is still missing. Related to this, given the predominance of conceptual or normative overviews, the question might be raised how evidence-based (Pawson, 2006) our current understanding about public sector innovation is. Do we really know what works and why, and under which circumstances?

In this article we therefore explore the empirical grounding of the knowledge that has been put forward in the scholarly literature on public sector innovation. Taking stock of this empirical knowledge is important to integrate the developed insights and to identify a research agenda, thereby contributing to the further institutionalization of the innovation theme in public administration. We explicitly chose to conduct a 'systematic review' (Moher et al., 2009). Systematic reviews differ from traditional literature reviews in that they are replicable and transparent. They involve several explicit steps such as: identifying

all likely relevant publications in a standardized way; extracting data from eligible studies; and synthesizing the results. When reporting, we will follow the ‘Preferred Reporting Items for Systematic Reviews and Meta-Analyses’ (PRISMA) approach (Moher et al., 2009).

To review the public sector innovation literature is no easy task. For instance, public sector innovation is a broad concept. We therefore firstly analyse how public sector innovation is defined. Secondly, we distinguish between various types of public sector innovation, such as product and process innovations and). Thirdly, we analyse why innovation has been started (the objectives of innovation). Fourthly, we look at the process of innovation, thereby focussing on factors that hamper or stimulate this process. Following Damanpour (1991, see also Damanpour & Schneider, 2009; Salge & Vera, 2012) we distinguish within this innovation process two stages: the innovation generating stage and the innovation adopting stage. In the literature it is supposed that the factors related to the diffusion and adoption stage are mainly centred around intrinsic innovation attributes (Rogers, 2003), which makes this phase rather different from the innovation generation stage. Is this claim true, when looking at the studies examined? Fifthly, we analyse the effects of innovation. Have certain innovations really resulted in for instance less costs and more citizen satisfaction?

Hence, our overall guiding research questions can be stated as follows:

1. *Which definitions of public sector innovation are being used?*
2. *Which public sector innovation types can be distinguished?*
3. *What are the objectives of public sector innovation?*
4. *Which factors influence the public sector innovation process, including the adoption and diffusion process?*
5. *What are the outcomes of the public sector innovation process?*

This brings us to the outline of this article. The next Section describes the concept of innovation the various types of innovation. In the section ‘Method’, we will describe the methodology used to conduct the review. The Section ‘Results’ will present the study characteristics of the eligible studies found and the answers to the research questions results of our review. Based on these results, in the last Section we will draw conclusions and develop a future research agenda on innovation in the public sector.

2 Defining innovation and innovation types

Definitions of innovation abound, each emphasizing different aspects of the term. The first definition was coined by Schumpeter (1942). Schumpeter stresses the novelty aspect of

innovations. Innovation is reflected in novel outputs: a new good or a new quality of a good, a new production method, a new market, a new supply source. It can be summarized as: ‘doing things differently’. Related to this, contemporary literature (see for instance Borins, 2014; Walker, 2014) often uses the definition of Rogers (2003: 12) who states that innovation is ‘an idea, practice, or object that is perceived as new by an individual or other unit of adoption’. Hence, something does not have to be objectively ‘new’, it should be *perceived* as new. Given that it is very difficult (and sometimes irrelevant for the innovation process) to establish whether something is ‘objectively’ new, we therefore follow contemporary scholars and focus on perceived newness.

When defining innovation it is important to analyse the difference between change and innovation. Hansen & Wakonen (1997: 350) state that ‘it is practically impossible to do things identically’ which makes any change an innovation by definition. Osborne & Brown (2005) therefore argue that innovation is a specific form of change: innovation is discontinuous change: it is a radical break from the past.

Based on Osborne & Brown (2005) and Rogers (2003), we define innovation in the public sector as ‘the introduction of new elements into a public service - in the form of new knowledge, a new organization, and/or new management or processual skills, which represents discontinuity with the past’. The definition also insists that innovation is not merely about getting a new idea, but that it also has to be used in practice.

The definition of innovation in the public sector is quite broad. Therefore, innovation types are often specified (Moore & Hartley, 2008). Based on a review of the literature we used the following classification of innovation types, shown in Table 1 (examined in section 4.5). The innovation types used are 1) process innovation (focused on either the technological or administrative core of the organisation), 2) product or service innovation, 3) governance innovation and 4) conceptual innovation.

Innovation type	Focus	References	Examples
1. Process innovation	Improvement of quality and efficiency of internal and external processes	Walker, 2014; Damanpour & Gopalakrishnan, 2001	
<i>Administrative process innovation</i>	Creation of new organizational forms, the introduction of new management methods and techniques and new working methods	Daft, 1978; Meeus & Equist, 2006	The creation of a 'one-stop shop' by a municipality, where citizens can get various services at one location
<i>Technological process innovation</i>	Creation or use of new technologies, introduced in an organization to render its services to users and citizens	Edquist et al., 2001; Damanpour & Gopalakrishnan, 2001	The digital assessment of taxes
2. Product or service innovation	Creation of new public services or products	Damanpour et al., 2009	The creation of youth work disability benefits
3. Governance innovation	Development of new forms and processes to address specific societal problems	Moore & Hartley, 2008; Bekkers et al., 2011	Governance practice that attempts to enhance the self-regulating and self-organizing capacities of policy networks
4. Conceptual innovation	Introduction of new concepts, frames of reference or new paradigms that help to reframe the nature of specific problems as well as their possible solutions	Bekkers et al., 2011	The introduction of the paradigm that when looking at a person's work (dis)ability, insurance physicians no longer analyze what people cannot do, but instead analyze what they still can do, hence focusing on work ability potential

Table 1: Types of public sector innovation

Although we categorized innovation in four main categories we acknowledge that in practices these types are often intertwined, creating hybrid forms (Damanpour, 1991). When analysing the articles, each innovation studied was divided in one of the above mentioned categories according to their main goal (as formulated in the records studied). This will be discussed in more detail below.

3 Method

3.1 Systematic review

Defining innovation and classifying various types of innovation gives us a background for studying the broad field of innovation in the public sector. As noted, a systematic review addresses can improve the quality of the review process and outcome by employing a reproducible procedure.

3.2 Eligibility criteria

PRISMA distinguishes study eligibility and report eligibility criteria. We also followed the checklist with preferred items for reporting, for instance by describing the selection process of the studies (see Moher et al., 2009 for all items). Based on Moher et al. (2009) the following eligibility criteria were used:

- *Type of studies* - Records should deal with innovation in the public sector. We defined the public sector as the 'those parts of the economy that are either in state ownership or under contract to the state, plus those parts that are regulated or subsidized in the public context' (Flynn, 2007: 2).
- *Topic* - Records should contain the words 'innovation' in their title and/or abstract, in order to prevent mix-up with related concepts. The word 'public' did not have to be necessary in the title or abstract, because sometimes studies are carried out in a specific policy field (such as education) without mentioning the term 'public'. Therefore, when examining our results we looked specifically into the specific public sector area of the record studied.
- *Study design* - Only empirical studies are eligible, as we are interested in the empirical evidence on public sector innovation. All types of systematic research designs are included (questionnaire, case study, experiment). Case studies which were only illustrative in nature were not included.
- *Year of publication* - Studies were retrieved that were published in the period from 1990-2014. We selected the period from 1990 to 2014 given that two important publications were published shortly after, namely that of Hood (1991) and Osborne & Gaebler (1992). Both authors provided great input to the NPM debate, which in turn stimulated new ways of working in governmental organizations and resulted in a growing attention for public sector innovation.
- *Language* - Only studies written in English were taken into account.
- *Publication status* - Only international peer-reviewed journal articles were included or books from well-established publishers in the field of public administration and innovation.

3.3 Search strategies

Four complementary searching strategies were used to find relevant studies. First, electronic databases (1990-2013) were searched for publications on public innovation. This search was applied to ISI Web of Knowledge and Scopus in the period September 2013 till February 2014. After searching for the studies, the records were assessed based on their eligibility by reading abstracts and full texts. Secondly, we searched for journal articles published in five

top public administration journals, namely *Journal of Public Administration Research and Theory*, *Public Administration*, *Public Administration Review*, *Public Management Review* and *Governance*. Thirdly, we also searched for relevant books on the topic. Finally, we contacted experts of public innovation for additional publications in order to make sure that no key publications were left out (see acknowledgements, omitted in this version of the manuscript given blind review purposes).

3.4 Study selection

In total, we screened almost 10,000 studies. Based on the eligibility criteria, we included 158 studies. Our selection process is presented in Figure 1.

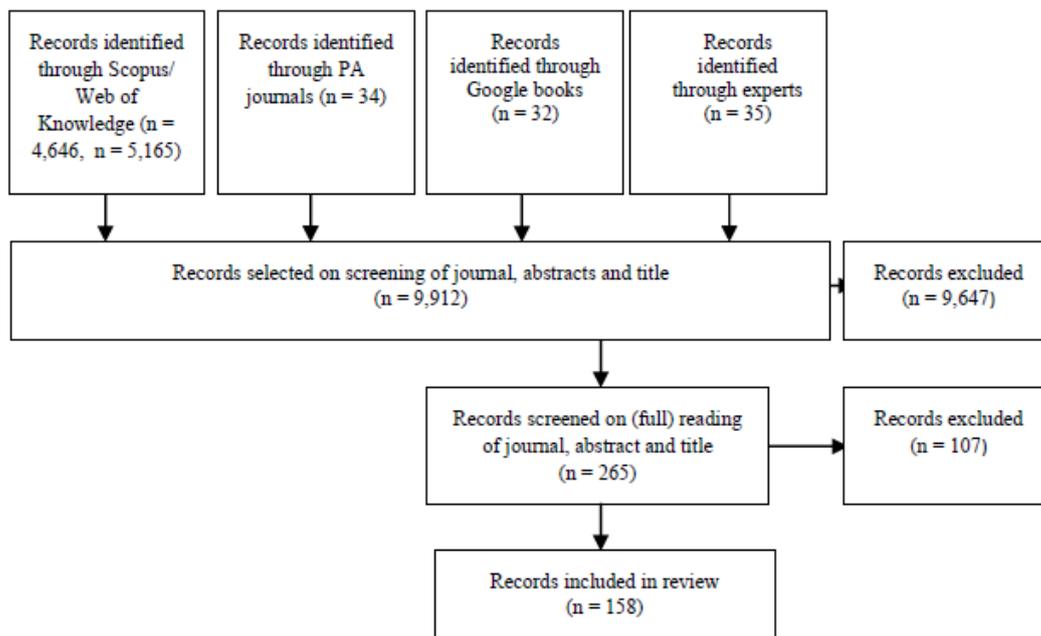


Figure 1: PRISMA flow diagram

4 Results

4.1 Journals and countries

The articles were published in 76 different journals. Most were published in *Public Management Review* (15), followed by *Public Administration* (10), *Public Administration Review* (10) and the *Journal of Public Administration Research and Theory* (9). Beside the public administration journals, journals differed to very specific and one area dedicated journals such as *Health Care Management Review*. The synthesized results of all records also show that the number of studies has increased rapidly during the last three years: 60%

of all articles were published between 2009-2014, the other 40% were published between 1990-2009.

A large amount of studies were conducted in the UK and USA with respectively 39 (25%) and 33 (21%) studies. This suggests that the USA/Anglo-perspective is central in studying innovation and change (see also Kuipers et al., 2014), which can also have important implications as there might be an institutional bias present. It might also influence the external validity of the findings, questioning how applicable they are in other western (e.g. Europe) or non-western settings (e.g. China). Finally, most records studied (126; 80%) were conducted in one country, which indicates a lack of cross-country comparisons.

4.2 Research methods

Most studies analysed were qualitative in nature (105; 60%), using mainly a single (44) or multiple (17) case study approach. Quantitative studies were less present (50; 29%). Hence, a qualitative bias prevails. This also implies that the context of innovation and the factors within this context received substantial attention. Only a small group of articles (19; 11%) was based on data that were both quantitative and qualitative in nature (e.g. Nählinder, 2010).

4.3 Policy fields and government layers

Because of the broad search of our review on public sector innovation studies in general, we were also interested in the specific policy fields in which the innovations took place as well the dominant layer of government.

Policy field / Government layer	Number
Government layer - Local government	53 (28%)
Government layer - Central government	36 (19%)
Healthcare	27 (14%)
Government layer - Regional government	15 (8%)
Education	11 (6%)
Welfare	9 (5%)
Other	19 (11%)
Multiple sectors (more than three)	17 (9%)
Total N = 187 (100%) – some studies included more than one policy field	

Table 1: Policy fields and government layers

Most innovation studies were conducted on the local government level (53; 28%), followed by central government (36; 19%) and healthcare (27; 14%), the latter often carried out in the UK (e.g. Turner et al., 2011). This dominant perspective of both policy fields (healthcare and local government) can be attributed to the UK Labour government program of supporting public management reform, which boosted innovation studies. Only a few

studies were conducted in welfare or education (e.g. Brown, 2010). The category ‘Other’ involved a broad range of policy fields and subsectors such as public transport (e.g. Ongkittikul & Geerlings, 2006). Various studies mentioned the public sector broadly without identifying subsectors (e.g. Kumar & Rose, 2012) or were carried out in multiple sectors (more than three) (e.g. Borins, 2002).

In the following sections we will answer our research questions: the used definition of innovation (RQ1, section 4.4), innovation types (RQ2, section 4.5), objectives (RQ3, section 4.6), influential factors (RQ4, section 4.7 general & 4.8 for diffusion & adoption) and outcomes (RQ5, section 4.9).

4.4 Used definitions

In this section we look at the different definition as applied in the studies and compare this with our own definition. The most remarkable finding is that most contributions do *not* provide a definition of innovation (114; 72%). The boundaries of the concept were not taken into account, for instance because the main topic of the study were innovators and not innovation itself (e.g. Meijer, 2014). If innovation was defined, scholars often used a quite general definition (we found 44 studies, 28%, which used a general definition). Most of these were directly based on Rogers (2003; 12) who defines innovation as ‘an idea, practice, or object that is perceived as new by an individual or other unit of adoption’. Also based on Rogers, various authors define innovation as ‘the adoption of an existing idea for the first time by a given organization’ (e.g. Borins, 2000). In addition 27 studies define also a specific type of innovation (like product innovation).

In general, two different dimensions are stressed in the definitions used, which aligns with the definition we proposed in Section 2. First, the (perceived) novelty was mentioned in 37 of the 44 general definitions (e.g. Bhatti et al., 2011). Second, the adopting of an idea for the first time by a given organization was also often noted (5 studies, e.g. Mack et al., 2008). A number of studies (17) also contain both elements (e.g. Salge & Vera, 2012). However, only one study referred to the degree in which a discontinuity with the past was present, as we included in our working definition (e.g. Fuglsang, 2008). This can be considered as a substantial lack because it offers the possibility to distinguish innovation from change (Osborne & Brown, 2005).

The following step is then to look at the different innovation types included in our review.

4.5 Innovation types

The different innovation categories and its subtypes, as formulated in Section 2, are included in Table 2. Each innovation was included in a certain category according to its main goal. Here again, we notice that it difficult to categorize innovation because of the interrelatedness of different innovation types (Damanpour, 1991).

Overall, our analysis shows that dominant body of empirical knowledge about public sector innovation is primarily focused on internal administrative, often technology driven processes.

Type	Number
Process innovation	94 (47%)
<i>Administrative process innovation</i>	78 (39%)
<i>Technological process innovation</i>	16 (8%)
Product/service innovation	41 (21%)
Governance innovation	26 (13%)
Conceptual innovation	4 (2%)
Other	35 (17%)
Total N = 200 (100%) - some studies included more than one type	

Table 2: Innovation types

First, as the table shows, by far the largest category consisted of *administrative process innovations* (as a subset of process innovations). They are often influenced by NPM-like ideas. For instance, Hansen (2011) analyses the relation between leadership and the adoption of innovations associated with NPM among 262 Danish public managers. Innovations examined included outsourcing initiatives of municipalities. The other group of innovations that springs forward are product or service innovations (e.g. Parma & Von Tunzelmann, 2007). In their article on public entrepreneurship in UK local government, Bartlett & Dibben (2002) included 12 case studies of this type of innovation, such as new bus routes.

In the literature much less attention is paid to technological process innovations (as a subset of process innovations and often related to E-government), governance innovations and conceptual innovations. For instance, Carter & Belanger (2005) describe how E-government initiatives like the online distribution of information increase the accessibility of government information to citizens. An example of an governance innovation can be found in the study of Schoeman (2012) where partnerships with private partners are put forward as a way to address societal challenges. This innovation type is also rising (65% of all studies about governance innovations were published between 2009-2014, the other 35% were published between 1990-2009). Finally, the category 'Other' yielded many, heterogeneous, results. Some studies were more or less focused on the behavioural

components of innovation such that of the public entrepreneur involved (Meijer, 2014). Other studies were primarily oriented on how to stimulate innovative capacity, for instance by examining the way US states could stimulate innovation (Johns et al., 2006).

Concluding, it can be stated that there seems to be a bias towards intra-organizational process innovations, which are often closely related to two major reform movements in public administration, namely NPM and E-government. This implies that other innovations, especially governance and conceptual as also inter-organizational innovations, have not been the subject of serious investigation.

Related to this, these innovation types can be considered the outcome of a process in which different objectives played a role. This is why we turn to the innovation objectives encountered in our review.

4.6 Innovation objectives

The following table show the objectives that public sector innovation must achieve, based on the results from the studies.

Main objective	Number
Increasing effectiveness	39 (17%)
Increasing efficiency	33 (14%)
Responding to the external environment	23 (10%)
Improving customer satisfaction	18 (8%)
Involving citizens	13 (6%)
Involving private partners	6 (3%)
Other (e.g. safety, responsiveness, quality of life)	15 (7%)
No objectives mentioned	82 (35%)
Total N = 229 (100%) – some studies included more than one objective	

Table 3: Innovation objectives

Two main conclusions can be drawn from this table. First, a striking conclusion is that in 35% of the articles studied no objectives were mentioned. This could be caused by the fact that studies did not focus on studying the objectives of innovation, but were for instance interested in the innovation process (e.g. Piening, 2011). On the other hand, it could also imply that innovation is a goal in itself: we innovate as we want to be innovative.

Secondly, we found that improving performance, expressed in terms of effectiveness and efficiency, was the most mentioned motivation for innovation (72; 31%). However, they are quite closely followed by objectives related to participation and cooperation (60; 24%), for instance reflected in involving citizens. Studies which mentioned the first kind of objectives highlight notions as ‘performing with less’ (e.g. Kim & Lee, 2009). This was especially the case in the UK healthcare sector (e.g. Turner et al., 2011),

where programs of the Labour government stimulated hospitals to adopt management practices, mostly due to the rise of NPM. Efficiency and effectiveness are often used together without differentiation (e.g. Micheli et al., 2012). The second kind of objectives (e.g. involving citizens, increasing customer satisfaction) were also mentioned in a variety of studies (e.g. Carter & Belanger, 2005).

These findings can be related to the two potential logics of action put forward by March & Olsen (1989): the logic of consequence and the logic of appropriateness. The logic of consequence looks at the effects of different alternatives. On the contrary, the logic of appropriateness means that actions are related to situations by means of rules organized into identities. The stressing of efficiency and effectiveness is often related to the logic of consequence (Weber et al., 2004). Typical for the logic of appropriateness is that it refers to the legitimacy of government and trust that citizens have that governments are able to deal with problems that they are concerned about, which for instance imply that citizens have to get more involved (e.g. Carter & Belanger, 2005). As a consequence, the presence of innovations that relate to both logics (respectively 31% and 24%) shows that public innovations are not inspired by the private sector as many NPM reforms suggest. Public sector innovation is not only about efficiency but it also focused on acquiring trust and legitimacy (e.g. March & Olsen, 1989; Bekkers et al., 2011).

The next step is then to identify the way in which these objectives have been established.

4.7 Influential factors

In this Section we analyse the influential factors related to the innovation process. Factors can be, dependent on the level of the factor and the specific context, either a driver or a barrier. When looking for these influential factors we found a rich variety, which we divided in drivers and barriers related to four main categories which refer to four levels:

- environmental level (e.g. political mandates);
- organizational level (e.g. organizational slack);
- innovation characteristics (e.g. complexity of the innovation);
- individual/employee level (e.g. empowerment).

Furthermore, in paragraph 4.8 we explicitly distinguish between factors related to the innovation generating process and factors related to the adoption and diffusion process. We describe innovation generation as ‘a process that results in an outcome that is new to an organizational population’ (Damanpour & Schneider, 2009: 497). Innovation adoption is ‘the voluntary and/or coercive process through which an organization passes from first knowledge of an innovation, to forming an attitude towards the innovation, to a decision to

adopt or reject, to implementation of the new idea, and to confirmation of this decision’ (Rogers, 2003: 20). The diffusion of an innovation can be defined as ‘a process in which an innovation is communicated through certain channels over time among the members of a social system’ (Rogers, 2003: 5).

In the literature it is supposed that the factors related to the diffusion and adoption stage are mainly centered around intrinsic innovation attributes (Rogers, 2003), which makes this phase rather different from the innovation generation stage. Is this claim true, when looking at the studies examined?

In the following subsection we will first describe the various influential factors encountered, where after we related these factors to the various stages.

Factors related to the environmental level

In Table 4 we present an overview of the influential factors related to the environmental level. Very often these influential factors are linked to the specific context in which organizations operate. This underlines the importance in the innovation literature that innovations are locally embedded, being the result of the co-evolution between different demands and pressures, stemming from different environments (Osborne & Brown, 2011). Issues dealt with included media attention (e.g. Borins, 2000), public pressures (e.g. Walker et al., 2011) and political demands (e.g. Rogers-Dillon, 1999). In practice these are often intertwined, mutually enforcing each other. A lot of these factors (e.g. the influence of political leader) are also typical for innovation in a public sector context.

The following table shows the influential factors related to the environment:

Factor	Number
Environmental pressures (media attention, political demands, public demands)	18 (28%)
Participation in networks and inter-organizational relationships	17 (27%)
Compatible agencies/organizations/states adopting the same innovation	8 (13%)
Regulatory aspects	8 (13%)
Competition with other organizations	4 (6%)
Other	9 (13%)
Total N = 64 (100%)	

Table 4: Influential environmental factors

When reflecting on the factors mentioned, environmental factors such as media attention, political are most mentioned. Secondly, participation with other partners and the adoption of their norms is frequently included (e.g. Mintrom & Vergari, 1998). The amount of compatible organizations adopting an innovation is also addressed (8; 13%). Berry (1994)

notes that the number of neighboring state agencies that have already adopted strategic planning increases the likelihood of innovation.

Finally, regulatory aspects are also included. Mostly, regulation is considered as hampering innovation (e.g. Johns et al., 2006). However, according to Rogers-Dillon (1999) prevailing wisdom, which holds that limiting the federal role in welfare will free states to be more innovative, can be misleading. In his study, the establishment of the Florida's Family Transition Program (FTP), a pilot welfare-to-work program, was the direct result of federal requirements imposed. Federal regulation, in this case, promoted innovation.

More generally, the notion of isomorphism which states that organization in the same fields became more alike (Meyer & Rowan, 1977; DiMaggio & Powell, 1991) might also play a role in explaining environmental pressures. For instance, organizations sometimes look at the innovative behavior of other compatible organizations and copy their innovation (e.g. Berry, 2004).

Factors related the organizational level

Many influential factors found in our review can be connected to the organizational context. What stands out most prominently? The following table present an overview of the influential organizational factors found:

Factor	Number
Slack resources (information, time, money, ICT facilities)	28 (21%)
Leadership styles	25 (19%)
Degree of risk aversion/room for learning	24 (19%)
Incentives/rewards/clear goals	22 (18%)
Conflicts	10 (8%)
Organizational structures	10 (8%)
Other	9 (7%)
Total N = 128 (100%)	

Table 5: Influential organizational factors

First, the availability of various organizational resources, especially in terms of organizational ‘slack’ (e.g. size, personnel, ICT facilities) seems to be the most mentioned influential factor. For instance, Walker (2006) argues that the larger an organization is, the more ‘slack’ the organization has, because it has more opportunities for the cross-fertilization of ideas as well as a larger variety of relevant skills that can be exploited. Besides size, often discussed slack factors are organizational wealth and capacity (e.g. Bhatti et al., 2011) and talented employees in the organization (e.g. Maranto & Wolf, 2013). Secondly, leadership issues are highlighted by several authors. Studies included frequently examined the kind of leader required such as leaders who have a vision and are ‘credible’

(Gabris et al., 2001). Thirdly, the degree of risk aversion was also mentioned in various studies, including the description of an administrative culture which hampers innovation (e.g. Piening, 2011). A large stream of literature also considered a learning cultural environment as necessary for promoting innovation, given the importance of ‘trial and error’ in exploring new ideas (e.g. Parna & Von Tunzelmann, 2007).

Factors related to innovation characteristics

In contrast to the previous two dimensions, there is less empirical attention for the influence of the characteristics of the innovation itself. Only a few studies, often when discussing the diffusion and adoption of innovations, mentioned them as being relevant. Table 6 describes the characteristics included in these studies.

Factor	Number
Ease in use of innovation	3 (22%)
Relative advantage	2 (14%)
Compatibility	2 (14%)
Trialability	2 (14%)
Other (e.g. co-adoption, cost, trustworthiness, mouldability)	5 (36%)
Total N = 14 (100%)	

Table 6: Influential innovation characteristics

The innovation characteristics most mentioned were perceived ease in use of the innovation (e.g. Carter & Belanger, 2005; Damanpour & Schneider, 2009), relative advantage and compatibility (e.g. Bekkers & Korteland, 2007). The main point of reference in these studies were the intrinsic characteristics of an innovation that were mentioned in in Rogers’ Diffusion of Innovations theory (2003).

Factors related to the individual level

Table 7 shows the number of influential factors related to the individual level. Empowered employees are often mentioned as an important source of successful innovation. In addition, job-related skills are highly valued. When including the results from the previous section we see both on the organizational level (with encompasses a strong focus on leadership) and the individual level (e.g. focused on innovative employees and their characteristics) that the role of agents is of great importance in enabling innovation.

Employee	Number
Employee autonomy (empowerment, voice)	10 (21%)
Organizational position (tenure, mobility)	8 (17%)
Job-related knowledge and skills (professionalism/experience)	8 (17%)
Creativity (risk-taking, solving of problems)	5 (11%)
Demographic aspects (age/gender)	5 (11%)
Commitment/satisfaction with job	3 (6%)
Shared perspective and norms	2 (4%)
Innovation acceptance (satisfaction with results)	2 (4%)
Other	4 (9%)
Total N = 47 (100%)	

Table 7: Influential individual factors

Furthermore, taken these different factors into consideration it is also interesting to see if the same factors are present in the diffusion and adoption stage of innovation. We present the factors that we have identified in the literature in the next section.

4.8 Influential factors related to the various stages of the innovation process

This section specifies the influential factors related to the adoption and diffusion stage of the innovation process, in contrast to the innovation generation process. Almost half of our records studied (70; 44%) dealt with adoption and/or diffusion, which shows that the diffusion and adoption process is rather well covered, although some authors claim differently (e.g. Hartley, 2005).

Table 8 summarizes the amount of influential factors involved in both studies on generation and adoption/diffusion of the innovation process. For each phase (e.g. generating and adoption/diffusion) we included the three factors most mentioned in our records studied.

Factor	Stage: generation of innovation	Stage: adoption/diffusion of innovation
Environmental	39 (60%)	25 (40%)
<i>Most mentioned factors</i>	Public pressures, participation in networks, compatible organizations adopting the same innovation	Compatible organizations adopting the same innovation, participation in networks, public pressures
Organizational	82 (64%)	46 (36%)
<i>Most mentioned factors</i>	Slack, leadership, risk-aversion	Slack, leadership, risk-aversion
Innovation	0	14 (100%)
<i>Most mentioned factors</i>	None	Complexity, relative advantage, compatibility
Individual	32 (68%)	15 (32%)
<i>Most mentioned factors</i>	Autonomy, organizational position, skills	Autonomy, age/gender, skills

Table 8: Influential factors related to the different stages of the innovation process

As expected, innovation characteristics were only included in the diffusion or adoption studies (e.g. Korteland & Bekkers, 2007). However, environmental, organizational and

individual factors are also present and influential in the adoption and diffusion stage, which shows that the adoption phase to some extent resembles the innovation generation phase. When looking at those overlapping factors between the two phases, similar patterns can be found. For instance, on the organizational side we encountered on both sides a strong emphasis on the role of organizational slack and innovative leaders (e.g. Bartlett & Dibben, 2002). Studies related to individual level both include autonomy (e.g. Walker, 2006) and skills. Hence our results implies that the alleged differences between these two different phases are not so big, if we look at relevant drivers and barriers.

The following diagram visualizes the results of the table. Some environmental, organizational and individual factors are mentioned in both phases. What they do not have in common is that innovation characteristics are only mentioned in the adoption phase, while regulatory aspects (like the influence of for instance federal rules) and creativity are mentioned more often in the innovation generation phase. This (small) differences can be linked to the specific properties of these factors. For instance, creativity might be of more importance in developing new ideas (e.g. generating stage), while innovation characteristics (e.g. relative advantage) are crucial to get an innovation adopted (e.g. Rogers, 2003).

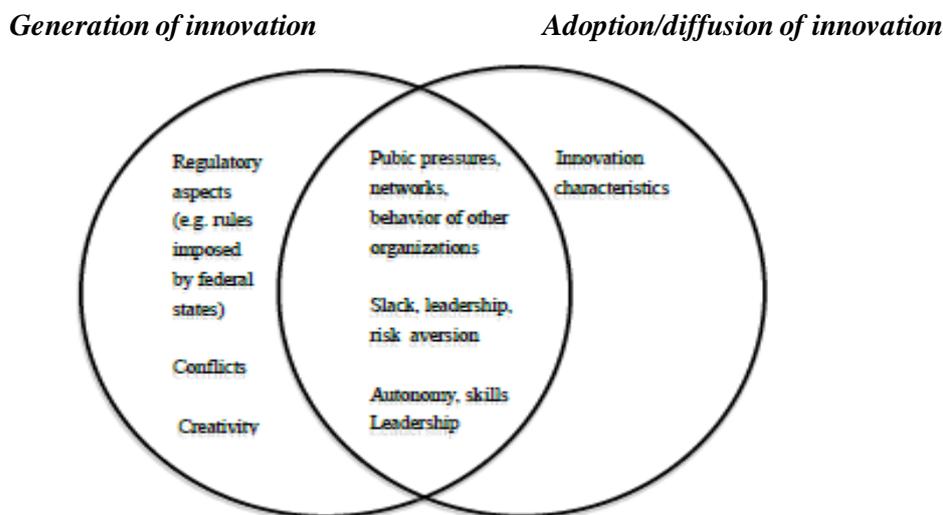


Figure 2: Influential factors related to the various stages of the innovation process

4.9 Innovation outcomes

The last research question deals with the outcomes of innovation. In line with Kuipers et al. (2014) we define the outcomes of an innovation as ‘substantive results of the implementation of an innovation that can be intended or unintended and positive or negative’. The outcomes are shown in Table 9.

Main outcome	Number
Increasing effectiveness	52 (28%)
Increasing efficiency	20 (11%)
Involving private partners	12 (6%)
Involving citizens	10 (5%)
Increasing customer satisfaction	10 (5%)
Other (safety, fairness etc.)	9 (4%)
No outcomes mentioned	77 (41%)
Total N = 190 (100%) – some studies included more than one outcome	

Table 9: Innovation outcomes

Two conclusions can be drawn. First, most studies do not report outcomes (77; 41%). Studies mentioned some objective of innovation in their introduction, for instance improving effectiveness and efficiency, but they did not often analyse whether these objectives were realized (e.g. Bartlett & Dibben, 2002). In addition, many articles only focused on the positive effects of innovations, where only a few articles specified failures of innovation or reported less innovative activity (e.g. Piening, 2011).

Second, if outcomes are reported, studies often mention increased effectiveness and efficiency as outcomes, in line with the objectives mentioned (e.g. Young et al., 2001). Other outcomes, like gaining citizen satisfaction, were less reported. Only a few studies describe the pursuit of more traditional public sector values such as safety and equality in schooling (Maranto & Wolf, 2013). Studies which mentioned these kind of outcomes (e.g. involving citizens) often also included performance features as being relevant outcomes. For instance, the study of Pope et al. (2006) examined the way the UK National Health Service (NHS) Treatment Centres (TCs) reduced waiting lists for elective care. This can be considered as both user-oriented (citizens get improved services) as efficiency focused (providing services with less effort).

We conclude that innovation is often considered as a value in itself, which also is in line with the previous observation regarding the lack of objectives that were reported when embarking on the innovation journey. This could imply that the process of generating or adopting an innovation is so important, which is also reflected by the process-oriented outcomes that were mentioned, in terms of involving private partners and citizens increasing

5 Conclusion

The goal of this article was to present a systematic review of the literature regarding innovation in the public sector. In doing so we aimed to take stock of the available empirical knowledge by integrating the developed insights. Furthermore, we aim to develop a future

research agenda, thereby contributing to the further institutionalization of the innovation theme in public administration.

A first conclusion regards the characteristics of the studies on public sector innovation. More than half of the studies we found used qualitative methods, such as interviews or focus groups. Quantitative studies – and especially mixed methods studies – were less present. Furthermore, there were almost no cross-national studies. Many studies were single country (often US or UK) qualitative case studies. This is understandable given the importance of the local context for studying innovation. However, conducting comparative studies that cut across various countries or sectors can for instance show to what extent factors are generalizable. Moreover, using a wider range of methods in public administration research (such as participant observations, surveys and experiments) can increase understanding, as all have their strengths and weaknesses. Hence, a future research suggestion would be to employ multi-method studies crossing across countries or sectors.

Using the method of a systematic review we distinguished between five dimensions of innovation which are (1) definition, (2) innovation types, (3) objectives, (4) influential factors (including factors related to the diffusion and adoption process) and (5) reported outcomes.

Our first research question addressed the definitions used. Based on Rogers (2003) and Osborne & Brown (2005), innovation was defined as ‘the introduction of new elements into a public service - in the form of new knowledge, a new organization, and/or new management or processual skills, which represents discontinuity with the past’. However, we found that many contributions do not provide a definition of innovation. Furthermore, when they did, they often did not stress the ‘discontinuity’ aspect. In the words of Osborne & Brown (2011: 1339), this is even a ‘fatal flaw’, as it misunderstands the different challenges posed: it is quite different to train someone for a new specific skill than to tell them that large parts of their skill set is redundant and that they need to retrain to retain their job. Based hereon, we would advise future studies to define innovation and to make a distinction between change and innovation, and be explicit about what they are studying.

The second research question analysed the different innovation types, which are 1) process, 2) product, 3) governance and 4) conceptual innovations. The review shows that the studies are primarily focused on internal administrative, often technology driven, process innovations. Product innovations are also often mentioned. However, governance and conceptual innovations were less often studied. Recently, there have been an uplift in studying governance innovation, often using concepts such as collaborative innovation (Sørensen & Torfing, 2011.) and open innovation (Lee et al., 2012). However, these are

still not dominant. Concluding, in the public sector innovation literature a dominance in studying process and product innovations is present. Future studies could tap the more unexplored areas on governance and conceptual innovations.

Thirdly, we analysed the objectives innovation must achieve. When objectives were mentioned, they were often related to the logic of consequence, such as improving effectiveness and efficiency, but also to the logic of appropriateness, such as involving citizens and increasing customer satisfaction. However, most studies did not mention a specific outcome. This could imply that innovation is often seen as a value in itself, referring to process of sense-making (Weick, 1995), in which an organization tries to convince its external environment as well as its members that it tries to make deal with changing circumstances in an appropriate way. Innovation processes can then be viewed as an important ritual that organization use to achieve legitimacy (Meyer & Rowan, 1977). Another explanation would be the presence of the so-called 'pro innovation bias': because innovation in itself is seen as something positive scholars and policy makers are not forced to be more specific (Rogers, 2003).

In our fourth research question, we analysed the factors that influence innovation, distinguishing between the environmental, organizational, innovation and individual level. Based on the influential factors encountered in our studies, the following empirical based model was formulated, providing an overview of these factors and outcomes:

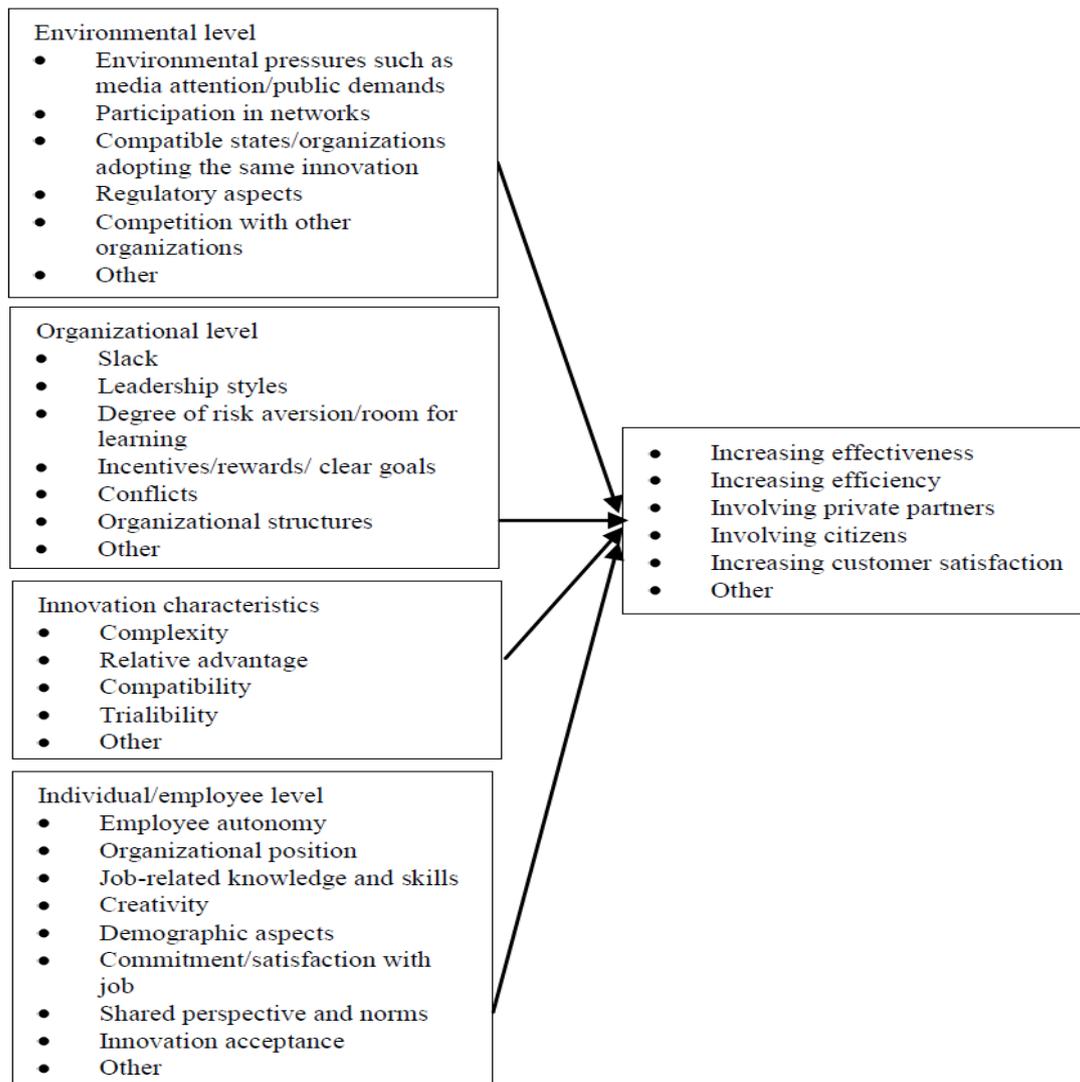


Figure 3: An empirical based model for studying innovation in the public sector

Especially on the environmental level, we found some elements typical for public sector innovation (e.g. political and public demands). For instance, if the media's interest in exposing public-sector failings, new innovation initiatives may be easily hampered (e.g. Borins, 2000). However, the relative importance of these factors in relation to other (not specific public sector related ones) could not always be disentangled. More generally, factors were often addressed separately, ignoring all kind of possible connections between them. Studies focused for instance only on organizational characteristics, neglecting other (e.g. environmental) elements. Related to this, very few studies depicted the role of networks in or between organizations (which contrasts business studies, see for instance Dhanaraj & Parkhe, 2006). In our review the external environment is mainly seen as an autonomous trigger or constraint (for instance in hampering regulation), but not in terms of a network to be mobilized. One possible explanation for this lack could be that most of the current governance literature is not framed in terms of public innovation. Taking into

account this stream of research in studying public sector innovation can therefore offer useful insights (Sørensen & Torfing, 2011).

In our fourth research question we also analysed the influential factors in both the innovation generation and adoption and diffusion stage of the innovation process. Factors as slack, leadership and individual autonomy are equally mentioned in relation to both phases, implying that the alleged difference between these two different phases is not so big as in the literature (Greenhalgh et al., 2004) is suggested or centered around innovation attributes. One possible explanation for this similarity between the individual factors in both phases might be that adoption also often encompasses a process of re-invention, re-innovation and experimenting (Rogers, 2003; Korteland & Bekkers, 2007). Moreover, also the alleged claim by some authors (Hartley, 2005) that in the public innovation literature hardly no attention is paid to the diffusion and adoption phase is not supported. A large portion of the literature did address this phase.

Fifthly, our last research question analysed the reported outcomes of innovation. In most cases no outcomes were reported. This is also in line with our previous conclusion that in studying innovation the emphasis primarily lies on the process as such, which seems to have a legitimacy of its own. More outcome based research could have the advantage that it makes clear if and how innovation does make a difference in a specific context; concrete outcomes can also be linked to the influential factors included in our review, showing their relative importance.

Hence, what does the results of our model imply for the state-of-the-art of public sector innovation and where should innovation research go from here? Currently, innovation reviews mostly focused on selected themes like the balance between risk and innovation. Many studies are also conceptually driven. In this way our article extended innovation research by presenting an empirical review of the influential factors and its reported effects. It reveals that innovation is increasingly studied during the last 5 years (60% of all articles were published between 2009-2014). However, because studies lack to explain the linkages between the influential factors found, a possible danger is that study results remain isolated. Studies are also limited in research methods applied (mainly qualitative) and conducted often in the UK or USA. Furthermore, innovation lacks clear definitions, resulting in possible mix ups with related concepts, while product and process innovation are the main topic of research.

Recent studies on private sector innovation shows an interesting pattern, revealing additional research areas that could also inspire public sector innovation studies. Both have in common that they primary study the main perceived function (the introduction of novelty) as well as the necessity of innovation in dealing with changing environments (e.g.

Fagerberg et al., 2005). Hence, both underline the importance of the external environment. However, important differences might be related to the political and public character of public sector innovation, in contrast to private innovation; how do these elements shape public innovation and its outcomes? Fagerberg et al. (2005) also stresses that private innovation tend to be clustered in certain sectors which will be hence more successful; it might be interesting to see if this also the case in the public sector. For instance, in our review innovation took mainly place on a local government level. Is this area hence more successful in achieving innovation objectives than others?

The role of open innovations and external parties is much more present in business administration literature (e.g. West et al., 2014) but an increasing topic in studies included in our review (e.g. Schoeman et al., 2012). This topic might also be addressed more frequently in the literature on network governance (e.g. Klijn & Koppejan, 2012), which still lacks connection to the public innovation field.

Uncovered topics in public sector innovation, but frequently included in business administration, are stretched along various dimensions. Firstly, authors make use of a much larger variety of methods, including longitudinal research (e.g. Perks & Roberts, 2014). The role of the individual (including personal traits and team participation, strongly influenced by organizational psychologists) also gets far more attention (e.g. Somech & Drach-Zahavy, 2013). For instance, Wu et al. (2014) addresses cognition as a necessary antecedent for individual innovative behaviour. Which of these antecedents are also relevant for public employees and how can transferable lessons from cognitive and social psychology about the ability of individuals to adopt particular innovations in particular circumstances be integrated (e.g. Greenhalgh et al., 2004)? Secondly, studies include end-users more explicitly as valuable stakeholders (e.g. Mahr et al., 2014). Thirdly, differences between radical and incremental innovations are very scarce in public administration, contrasting many private sector studies (see for instance Slater et al., 2014, who identify a set of organizational components that comprise a firm's radical product innovation capability). Hence, how could this distinction be applied to public sector innovation? Finally, our results neglect differences in national culture and governance traditions. There is a pointed gap in our understanding of innovation processes across different cultural contexts. This is most probably caused by the strong Anglo/USA focus in our studies. Hence, future research should link different types of governance and state traditions to the amount of public sector innovativeness, because it can be argued that these traditions reflect specific assumptions regarding the capacities of government in dealing with societal and political challenges (Pollitt & Bouckaert, 2011).

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