

Determinants and Barriers of Adoption, Diffusion and Upscaling of ICT-driven Social Innovation in the Public Sector

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Abstract

Since the raise of the New Public Management (NPM) paradigm, growing attention has been paid to public sector innovation, both as a political priority and as a fully-fledged field of study. A vast and well-established literature exists with respect to the determinants and the adoption of social innovation in the public sector. For example, the European Union (EU) has funded various research projects aiming to examine this issue from multiple standpoints. The purpose of this work is to investigate which are the determinants and the barriers in adopting, diffusing and upscaling ICT-driven social innovations within the public sector. Prevalently employing a systematic review as a methodology, a contribution to the existing literature is brought adopting specific focuses of research, which are: (1) those innovations characterized by a social content and that are – simultaneously – driven by ICT, and in particular those ones that assist human executed process (and which ostensibly have an organizational impact); (2) a detailed unpacking of the determinants and the barriers, in order to show how they can vary depending on the stage of the innovation lifecycle considered; (3) the late stages of innovation processes, which regard late adopters and “laggards” and which has to be further investigated (Albury 2005); (4) the stage of upscaling in particular, whose inherent literature is still scant, but which is also critical to ensure longer-term effects of innovation and to fully diffuse those innovations characterized by a “spotty” expansion and shallow patterns (Jun and Weare 2011). The work will firstly describe the political and the academic contexts which frame these issues. Punctual definitions of the main steams of research will be consequentially provided, in order to develop the analysis in a consistent way and to establish its boundaries. After this, the findings will be presented: the determinants and the barriers will be classified according to the inner or the outer contexts in which they can take place. The conclusions will thus seek to identify the most relevant and/or critical elements emerged in the findings, which are going to have implications for LIPSE WP5’s future (empirical) analyses.

Keywords: determinants; barriers; social innovation; public sector; ICT-driven innovation; technological innovation; e-government; adoption; diffusion upscaling; electronic procurement; telework.

1. Introduction

1.1. Context and relevance of ICT-driven social innovation

Since the raise of the New Public Management (NPM) paradigm, growing attention has been paid to the issue of public sector innovation: scholars have progressively developed a fully-fledged field of study in this direction, in the attempt of exploring the peculiar determinants and barriers of such a phenomenon, which can sensibly differ from those referred to business' environments. Perhaps paradoxically, the decline of NPM itself from 1990s onwards has paved the way to further developments of this field of studies (Dunleavy et al. 2006), surpassing the existent model through the exploration of innovative tools for stakeholders' involvement in decision-making (e.g. Cristofoli and Valotti 2005). Not only academics have emphasized the relevance of social innovation in the public sector: such claims have been embedded into political agendas at the sub-national, national and international levels of government. Social innovation in the public sector has even become a crucial topic in political discourses and electoral campaigns.

Almost the half of the European Union (EU) GDP is ascribable to the public sector, together with 20% of purchases of goods and services and 17% of employment. Even these few figures are suggestive with respect to the importance of innovating public sector environments. In light of this, the EU has accepted the challenge of ICT-driven social innovation¹: within the context of the Europe 2020 Strategy ([EU2020](#)), the [Digital Agenda for Europe](#) is one of the seven flagship initiatives established by the European Commission (EC) to improve life conditions of European citizens through digital technologies and to eventually achieve smart, sustainable and inclusive growth. Furthermore, the [European eGovernment Action Plan](#) (2011 – 2015) sets *Innovative eGovernment* as a priority for its successful realization.

Such a commitment of the EU for social innovation has been also demonstrated through the funding of various research projects. For instance, the *Theoretical, Empirical and Policy Foundations for Social Innovation in Europe* ([TEPSIE](#)) project can be mentioned, which has explored «empirical and policy foundations for developing the field of social innovation in Europe»; the *Coordinating for Cohesion in the Public Sector of the Future* ([COCOPS](#)) project has instead sought to «comparatively and quantitatively assess the impact of New Public Management-style reforms in European countries»; furthermore,

¹ http://ec.europa.eu/enterprise/policies/innovation/policy/social-innovation/index_en.htm

the *Welfare Innovation at the Local Level in Favour of Cohesion* ([WILCO](#)) project has «looked into [the] missing link between innovations at the local level and their successful transfer and implementation to other settings»; Finally, the *Learning Innovation from Public Sector Environments* ([LIPSE](#)) project itself (within which this work is embedded) is «studying the drivers and barriers of successful social innovation in the public sector».

1.2. WP5 research scope

A great body of literature exists on the determinants and the adoption of social innovations in the public sector. In this sense, punctually specifying the focuses of this research is crucial in order to clarify its innovative contribution:

- First of all, the purpose is to investigate which are the determinants and the barriers of those innovations within the public sector considerable as “social”. Public organizations engaged in social innovation embed different beliefs, interests and resources in such an innovative process for the attainment of outcomes that are aligned with stakeholders’ preferences and needs: the pursue of such a responsiveness is the core characteristic of social innovation.
- Our focus is also on those social innovations driven by ICT, which can spread change thanks to their capacity of processing large volumes of data and enabling communication across temporal, functional and geographical boundaries (Bekkers and Homburg 2005). The study of ICT-driven social innovation is thus interesting for the possibility of analyzing how stakeholders apply such technologies in their specific context: ICT are technical in nature but have political and social spillover effects as they are applied to specific contexts. In this sense, ICT usually implies organizational change (Kling 1987).
- The distinction delineated by Damanpour (1991) is taken into account: despite the overall fuzziness and complexity of innovation processes, a difference between innovation *generating* processes and innovation *adopting* processes exists. This means that the innovation cycle is examinable in distinct phases: once innovation has been prototyped and discovered by an organization, the challenge is to replicate it and scale it up (Mulgan and Albury 2003). Diffusion and adoption can be thus seen as new

innovation processes, because a fully-fledged re-invention is often required in order to tailor and adapt them to different contexts. Therefore, specific determinants and barriers characterize these stages of the cycle: for example, the ability of producing short-term, visible and concrete benefits is crucial for diffusing innovations (Rogers 2003). In general, the issue of late adopters and “laggards” has not been sufficiently investigated (Albury 2005).

- Moreover, attention will be paid in analyzing the phase of upscaling: albeit a well-established literature exists on upscaling innovation in the private sector, a systematic framework is missing with respect to social innovation, strongly characterized by “grey” contributions (Davies and Simon 2013). In addition, literature on upscaling of public sector innovation is scant, but further developing such a stream of research is a critical challenge: upscaling of innovation is essential to ensure its longer-term effects and to fully diffuse those innovations characterized by a “spotty” diffusion and shallow patterns (Jun and Weare 2011), until the achievement of a “critical mass”. The eventual success of social innovations in the public sector depends on the degree to which these innovations are adopted by other organizations: the adoption only by “champion” is not sufficient in ensuring a systemic change.
- Furthermore, the WP5 focuses on two specific types of ICT-driven innovations in the public sector: the first type of ICT innovation is e-procurement, referring to the use of ICT to carry out a number of stages of the procurement process, including search, sourcing, negotiation, ordering, receipt, and post-purchase review. This technology is relevant because it contributes to a more dynamic, transparent and competitive environment in which government has to operate, which might stimulate innovation. The second type refers to ICT and new media technologies that are focused on the creation of new ways of working (the so-called telework), which provide civil servants with instruments to work at home, while making use of the ICT and data infrastructure of their organization. Especially the penetration of new social media – in their ability to connect different stakeholders and resources for creating and mobilizing new knowledge – offers new possibilities to public employees to co-create a working environment that is compatible with their work/life balance. This is also important for the attractiveness of public sector as an employer.

The research scope is to identify the current gaps in literature and to possibly fill them; this will ensure to integrate the existent LIPSE framework with a peculiar perspective, that is, the specific focus of WP5. The main WP5 streams of research can be thus summarized as follows:

- (Social) innovation in the public sector;
- ICT-driven innovation / technological innovation;
- E-government;
- Determinants and barriers;
- Adoption, diffusion and upscaling of innovation;
- Electronic procurement;
- Telework.

The research question(s) of the WP5 can be now formulated:

Which are the determinants and the barriers of the adoption, the diffusion and the upscaling of ICT-driven social innovation in the public sector?

Which are those specifically referred to e-procurement and telework?

2. WP5 definitions

Before proceeding in explaining how we will carry out the investigation, punctual definitions of our main streams of research have to be provided, in order to ensure a clear and consistent development of the analysis and to establish its own boundaries.

Social innovation in the public sector

First, fixing a definition of *public sector* can be useful for delimitating the analysis to a certain category of organizations: Flynn (2007) describes it as «those parts of economy that are either in state ownership or under contract of the state, plus those parts that are regulated or subsidized in the public context». Second, *innovation in the public sector* is defined by Osborne and Brown (2005) 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 represent discontinuity with the past». Newness and discontinuity thus emerge as the central characteristics of innovation. Simultaneously, the EC accepts the definition of social innovation provided by Murray et al. (2010), who define it as «new ideas (products, services and models) that simultaneously meet social needs (more effectively than alternatives) and create new social relationships or collaborations».

This first overview can clarify what *social innovation in the public sector* is. As mentioned before, public organizations that pursue social innovation are committed to be responsive to multiple beliefs, interests and resources for the achievement of solutions that are consistent with the *preferences* and the *needs* of relevant stakeholders, such as citizens, businesses and non-governmental organizations. Therefore, social and political value is expected to be generated for a large portion of stakeholders as a core outcome of these processes. The emergent importance of internal and external stakeholders can be ascribed to the shift from *government* to *governance* (Mayntz 2003) registered in the last decades.

ICT-driven innovation and e-government

The processes that we have just illustrated can be driven by various element: this work focuses on *ICT-driven innovation* in the public sector, which is defined by the EC as «the use of Information and Communication Technologies (ICT) for the creation and implementation of new processes, products, services and methods of delivery which result in significant improvements in the efficiency, effectiveness and quality of public services as

well as the wider operations of the public sector»², thus considering the definition of innovation in the public sector proposed by Mulgan and Albury (2003).

A number of international organizations have offered definitions of *e-government*. The EU refers to it as the «use of digital tools and systems to provide better public services to citizens and businesses»; a broader (and perhaps more vague) description is provided by the OECD: e-government is «the use of information and communication technologies, and particularly the Internet, as a tool to achieve better government»; finally, the UN defines it as «the employment of the Internet and the world-wide-web for delivering government information and services to the citizens». These three definitions seem to point to a notion of e-government that includes enabling and/or improving public service delivery through ICTs; internal processes and specific skills are also needed to achieve such results and are therefore included in the notion of e-government we offer here.

Determinants and barriers

Identifying a univocal definition of determinants is challenging, because of the wideness of this concept and its numerous (quasi-) synonymises. At any rate, Damanpour (1991) can be recalled, who refers to them as «influences to organizational innovation in different categories, including the individual, organizational, and environmental». Therefore, determinants can act as facilitators and/or barriers, depending on the inherent context, the interaction among them, the stage of the innovation cycle, etc. For this reason, we aimed at developing a more fine-grained analysis by understanding these influencing factors, i.e. whether they are more likely to promote (e.g. drivers, facilitators, etc.) or impede (e.g. barriers, obstacles, etc.) the adoption, diffusion and upscaling of innovation. With specific regard to the definition of barrier, it can be deducted from Borins (2001), who describe them as the wide variety of obstacles to innovation, including those that arise within the bureaucracy, at the political level, and outside the public sector. In this sense, barriers are determinants that may negatively affect the adoption of innovation.

Adoption, diffusion and upscaling

As mentioned before, the innovation cycle is examinable as a series of different stages and this research is focused on adoption, diffusion and upscaling. Adoption can be specifically defined as «the [voluntary and/or coercive] process through which [an

² See http://ec.europa.eu/information_society/newsroom/cf/dae/document.cfm?doc_id=1775

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). Diffusion can be instead described as «a process in which an innovation is communicated through certain channels over time among the members of a social system» (*ibidem* 2003). A definition of upscaling is instead provided by Mulgan and Albury (2003), who define it as the «replication of a (small and successful) proportion of innovative ideas and pilots on a larger scale».

Electronic procurement and telework

Finally, the EU describes e-procurement «the use of electronic communication and transaction processing by government institutions and other public sector organizations when buying supplies and services or tendering for public works»³ and telework as «a form of organizing and/or performing work, using information technology, in the context of an employment contract/relationship, where work, which could also be performed at the employer's premises, is carried out away from those premises on a regular basis»⁴.

³ See http://europa.eu/rapid/press-release_MEMO-12-265_en.htm?locale=en

⁴ See http://europa.eu/legislation_summaries/employment_and_social_policy/employment_rights_and_work_organisation/c10131_en.htm

3. WP5 research methodology

3.1. WP5 literature review

Once defined the purposes and the contents of this research, it is necessary to explain how to achieve its inherent objectives, that is, the methodology. In order to answer to the research questions, a review of the existent literature has been developed. Perhaps more importantly, most of the literature reviewed in this study (i.e. journal articles) has been included through a *systematic review*: this facilitates the achievement of a more solid review process, since such a procedure can be replicated (Tranfield et al. 2003). Launching such a process requires the establishment of clear eligibility criteria.

3.2. WP5 eligibility criteria

Eligibility criteria on studies' characteristics have been fixed for the systematic review, in order to select a proper portion of the existent literature. On the basis of Liberati et al. (2009), such criteria can be listed as follows:

- *Type of studies* – Records should deal with ICT-driven social innovation in the public sector, with a particular focus on those innovations that assist human executed processes, and that therefore have an organizational impact.
- *Topic* – Records should contain these words in their titles, abstracts or keywords:

“innovat*” OR “ict-driven” OR “technolog*” OR “e-government*” OR “egovernment” OR “electronic government” OR “digital”
AND
“determinant*” OR “barrier*” OR “driver*” OR “incent*” OR “facilitat*” OR “enabl*” OR “antecedent*” OR “characteristic*” OR “factor*” OR “element*”
AND
“diffus*” OR “adopt*” OR “upscal*” OR “scal* up” OR “implement*” OR “growth” OR “disseminat*” OR “evaluat*”

The word “public” does not have to be necessarily present, because some studies can deal with public topics without mentioning the word “public” (e.g. “education”). Moreover, records’ presence in public administration journals would be *per se* significant of their pertinence. Such “filter-words” may be judged as excessively loose, since they allow to a broad set of works to be included. However, there is an inherent trade-off between wideness and pertinence in establishing criteria. Therefore, we preferred to initially include more records and to eventually exclude a portion of them through a manual selection⁵.

- *Study design*: Both empirical (e.g. case studies, experiments, questionnaires) and theoretical studies are included.
- *Year of publication*: Studies published between 1970 and 2013 are eligible, since the first relevant literature on determinants and barriers and on ICT-driven innovation has been published from 1970s onwards, e.g. Fren dreis (1978), Damanpour (1987).
- *Language*: Only records written in English are eligible.
- *Publication status*: Only international peer-reviewed journal articles are eligible.

3.3. WP5 search strategy and process

The WP5 systematic review has been conducted on thirteen internationally preeminent journals:

- **Public administration journals** (*Journal of Public Administration Research and Theory, Public Administration Review, Public Administration, Public Management Review, American Review of Public Administration, International Public Management Journal*);
- **E-government journals** (*Government Information Quarterly, HICSS Proceedings, International Journal of E-Government Research, Electronic Journal of E-Government, Social Science Computer Review*);
- **Management journals** (*Journal of Management Studies, Journal of Management*).

⁵ The criteria for this manual selection will be explicated in section 3.4 (“WP5 study selection”).

Together with these journals, additional sources have been included (even if not systematically reviewed):

- Articles from other journals or conferences have been analyzed if considered as crucial contributions to the issue;
- Other genres of journals have been reviewed to collect material on e-procurement and telework: more specifically, public procurement journals (e.g. *Journal of Public Procurement*) and organizational studies journals (e.g. *Journal of Organizational Studies*) are taken into account;
- Relevant books from well-established publishers in the field of public administration and innovation are also reviewed;
- Documents (e.g. reports) produced by the other EU social innovation projects previously mentioned (e.g. LIPSE, TEPSIE, COCOPS, WILCO) have been analyzed.

Finally, it is due noticing that the existing LIPSE systematic review (De Vries et al. 2014) is used as a benchmark in collecting the records and that various online databases are employed in this research (e.g. Web of Science, JStor, Emerald, journals' and books websites).

3.4. WP5 study selection

The selection process is graphically presented in *Figure 1*. Its main steps can be summarized as follows:

- With respect to all the sources screened in a non-systematic manner, 59 records have been chosen;
- With respect to the systematic review (thirteen journals), 395 records fulfilled the eligibility criteria;
- Therefore, the total number of records was 454 (59 + 395);
- However, the records that fulfilled the eligibility criteria (395) have been successively screened by two researchers, who have manually excluded those that were not pertinent;

- With regard to the exclusion criteria, the researchers have judged certain records as not pertinent through the reading of the articles themselves: those ones that did not fit with the definitions of our steams of research have been thus excluded;
- After this step, 194 articles have been eventually included in the systematic review;
- Therefore, the final number of records is 253 (59 + 194).

Figure 2 shows the same process when exclusively applied to the topic of upscaling: this is insightful with respect to the scant literature referred to this phenomenon.

Figure 1. Determinants and barriers of adoption, diffusion and upscaling of ICT-driven social innovation in the public sector

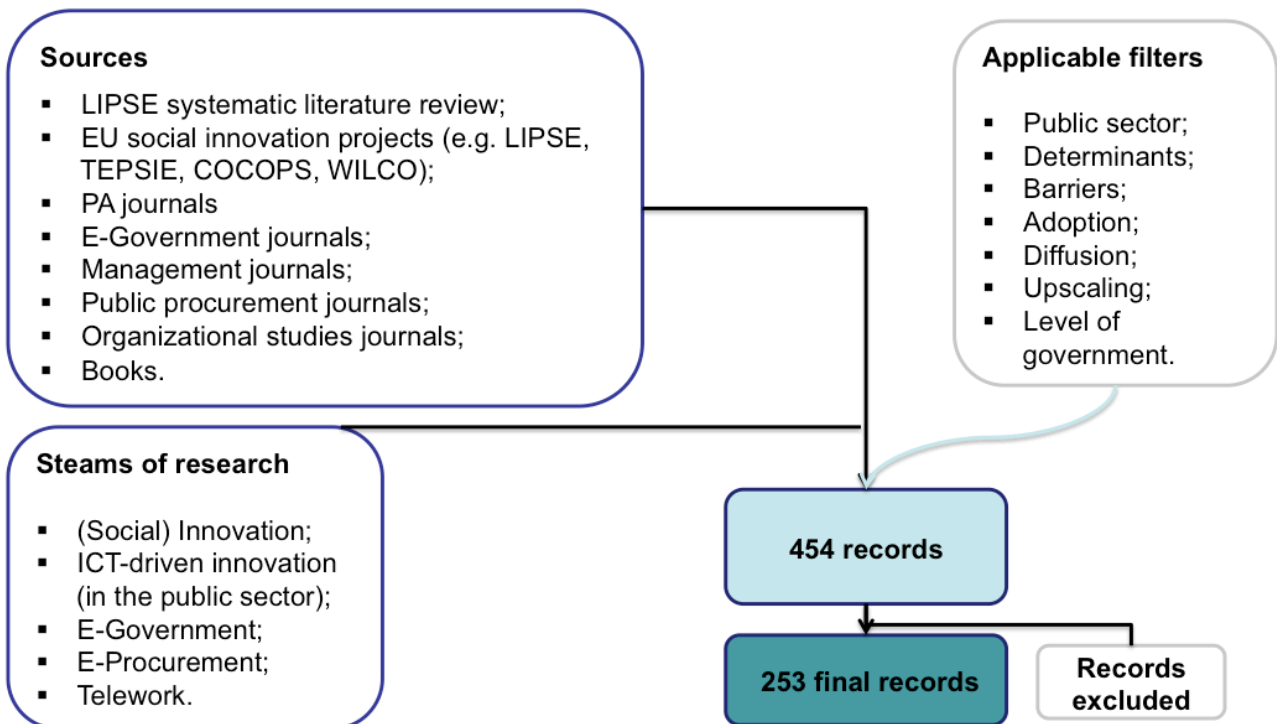
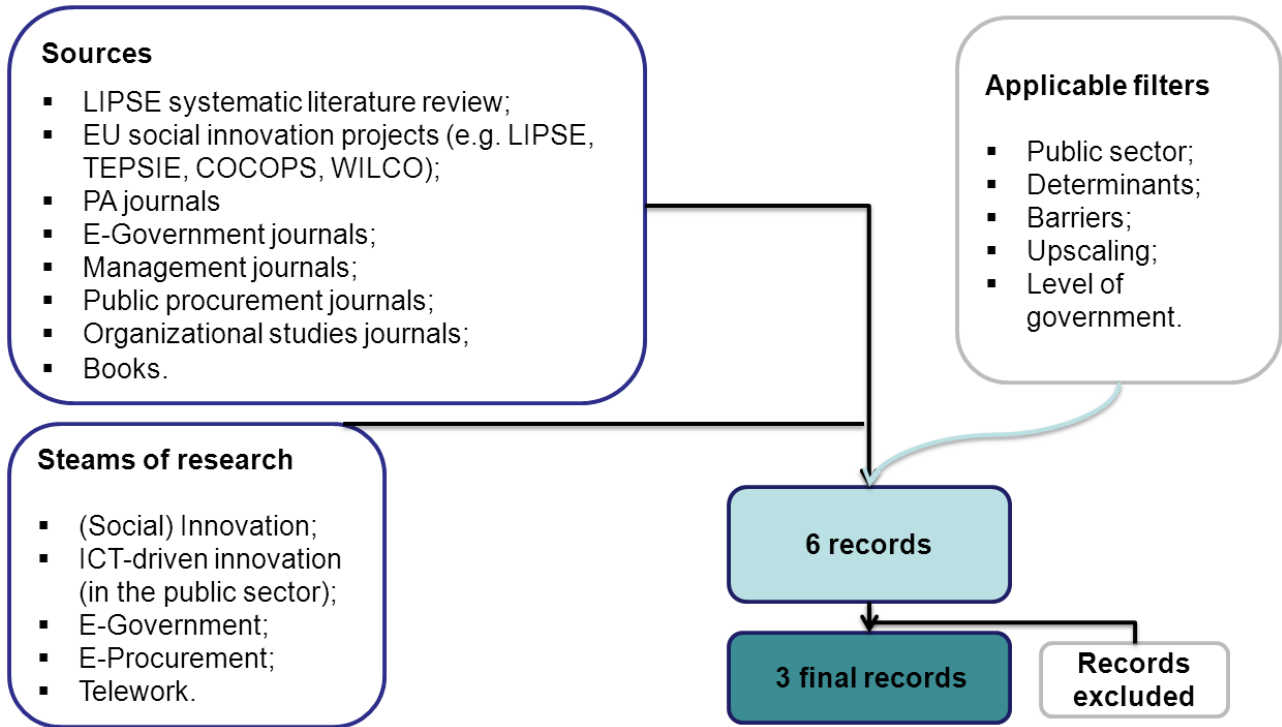


Figure 2. Determinants and barriers upscaling of ICT-driven social innovation in the public sector



4. Study characteristics

4.1. Journals

As mentioned before, the records included through the systematic review (194) are articles published in different peer-reviewed international journals, in the field of public administration and management, electronic government and management studies. The number of records included per each journal through this process is showed below (cf. *Table 1*)

Table 1. Journals and articles systematically reviewed

FIELD OF STUDY	JOURNAL	NUMBER OF RECORDS INCLUDED
Public administration and management (58 records included)	Journal of Public Administration Research and Theory	9
	Public Administration	8
	Public Administration Review	17
	Public Management Review	5
	The American Review of Public Administration	13
	International Public Management Journal	6
Electronic government (135 records included)	Government Information Quarterly	40
	Electronic Journal of e-Government	32
	International Journal of Electronic Government Research	31
	Social Science Computer Review	10
	HICCS Proceedings (1995 - 2013)	22
Management studies (1 record included)	Journal of Management	1
	Journal of Management Studies	0
TOTAL NUMBER OF RECORDS INCLUDED		194

Just 3 articles were published until 1990. 13 articles were published between 1991 and 2000, while 102 articles were published between 2001 and 2010. Finally, 76 articles were published between 2011 and 2013. This information shows how the issue has been characterized by an increasing interest by scholars during the decades, and it has now probably reached a mainstream attention.

4.2. *Research methods*

Further relevant information emerges observing the methodology used in these articles. In this sense, the most relevant facts can be summarized as follows:

- Most of the articles are empirical (155; 79.9%), while a smaller portion is theoretical (26; 13.4%) and a residual one brings together these two typologies (13; 6.7%). Osborne and Brown (2011), Cordella and Bonina (2012) and Walker (2013) are among the most recent and prominent theoretical works included in the systematic review.
- Among empirical studies, the majority is qualitative in nature (84; 43.3%), while there are 73 (37.6%) quantitative works; moreover, 11 studies (5.7%) are based both on qualitative and quantitative data: an example is the work by Hunnius and Schuppan (2013), who have employed both a survey and focus group workshops in investigating ICT-enabled transformation in the public sector.
- Case study researches (i.e. single or multiple case studies) represent the majority of qualitative studies (60; 30.9%), while the rest are mainly based on interviews or document analyses (e.g. Ganapati 2011; Furuholt and Wahid 2008). The work by Korteland and Bekkers (2008) – in their investigation on adoption and diffusion SMS-alert among Dutch police forces – is a notable example of case study research.
- Quantitative works use data from questionnaires (25; 12.9%), from secondary survey and/or existent datasets (23; 11.9%) or from both of them (25; 12.9%), as in the case of Damanpour and Schneider (2009) in their analysis of the adoption of innovation in 725 US local governments.

This information is insightful with respect the main research trends in this field: the prevalence of empirical studies indicates the existence of a well-established theoretical “soil”. Furthermore, an acceptable balance exists between qualitative and quantitative studies; yet, the need for further quantitative contributions may be advocated for future researches so to attain greater external validity.

4.3. Geographical contexts

With respect to the geographical context analyzed, the USA is certainly the preferred country for empirical analyses (62 articles; 40%). For a fuller overview on Anglo-Saxon contribution, we can also include works on UK (16; 8%), Canada (2; 1%); Australia (2; 1%) and New Zealand (1; 0.5%): this means that approximately half of the works analyzes Anglo-Saxon contexts. This is meaningful with respect to the cultural perspective adopted in studying innovation. Perhaps surprisingly, there are more studies focused on Asian countries (25; 12.9%) than on European ones (23; 11.9%). There are also studies that regard African and Latin American countries (5 studies each, 2.5%). Finally, a remarkable portion of studies is cross-national (29; 15%). It is interesting noticing that studies on Anglo-Saxon contexts prevail within public administration and management journals (39; 20.1%), while an abundance of articles on developing countries can be found on e-government journals.

4.4. Policy fields

An overview on the levels of government / policy fields treated in the articles systematically reviewed is provided below (cf. *Table 2*):

Table 2.

Policy fields	Number	Percentage
Central government	64	33%
Local or regional government	72	37%
Multi-level	20	10%
Other	14	7%
Total	170	84%

Studies on central government regard national governments (e.g. Lee et al. 2011; Rodriguez Dominguez et al. 2011), national agencies (e.g. Valdes et al. 2011) or states of the USA (e.g. Yun and Opheim 2010; Reddick 2004). Those ones that analyze local or regional government mainly regard cities or municipalities (e.g. Gallego-Alvarez et al. 2010; Ahn 2011) and US counties (e.g. Manoharan 2013). The category “Other” encompasses a variety of policy fields such as justice (e.g. Contini and Cordella 2007), welfare (e.g. Fernandez and Wise 2010), security (e.g. Korteland and Bekkers 2008), education (e.g. Kapoor et al. 2011) and environmental policy (e.g. Teodoro 2010).

5. WP5 findings

Each phase of the innovation cycle is characterized by specific influencing factors: this means that different determinants and barriers can be encountered when considering the adoption, the diffusion or the upscaling of ICT-driven innovation in public sector environments. Taking cognizance of previous studies and comprehensive reviews (e.g. Greenhalgh et al. 2004; Greenhalgh et al. 2005), a distinction is applied between the “outer” and the “inner” contexts in which influencing factors: the “outer” context regards the wider environmental factors, while the “inner” context is referred to those characteristics that are intrinsically related to the organization. For example, Norris and Moon (2005) make a distinction between environmental and organizational factors, while Walker (2013) has employed a similar differentiation, distinguishing between internal and external antecedents of innovation in the public sector. In the following part, a review of the literature is firstly presented; after this, specific sections are dedicated to the two ICT-driven innovations selected, which are, electronic procurement and telework.

5.1. *Determinants and barriers referred to the outer context*

5.1.1. *Inter-institutional dynamics*

The presence of similar entities within the same context emerges as one of the most crucial determinant in adopting ICT-driven social innovations: a vast portion of literature emphasizes how emulative are the organizations, and this is noteworthy for late adopters, followers and laggards. Such phenomena have been variously described as inter-jurisdictional competition (Jun and Weare 2011; Bailey 2011), isomorphism (Meyer and Rowan 1977, DiMaggio and Powell 1983, Powell 1991; Thatcher et al. 2006) or mimicking (Bouckaert 2008, Pollitt and Bouckaert 2011, Walker et al. 2011; Kassim and Hussin 2013), which in turn can be affected by external coercive pressures (Alatawi et al. 2013). Adopting innovative practices thus become desirable for organizations operating in the same field (Roy and Seguin, 2000), which tend to model themselves in respect of innovative organizations (Di Maggio and Powell 1983, Powell 1991; Bason 2010).

For instance, Bhatti et al. (2011) examine how institutional, political and economic characteristics of municipalities influence the likelihood of adoption: their findings underline that mimicry, learning or competition can foster innovations to cluster geographically. In particular, learning refers to ‘trial and error’ and to the visibility of an innovation’s relative advantages (Korteland and Bekkers, 2007). This element has a twofold implication: (1)

knowledge intermediaries fulfil an important role in such a transfer (Korteland & Bekkers, 2007; Behn, 2008; Horne 2008); (2) the diffusion strategy that the original innovator to promote an innovation is the *primum movens* of upscaling (Korteland and Bekkers 2007). The presence of innovation “champions” in such imitative contexts is decisive (e.g. Kindrum and Koch 2008), since they assume the role of beacons *vis-à-vis* late adopters (Mulgan and Albury 2003).

This kind of phenomena is sometimes subjected to processes of “institutionalization”: this means that inter-institutional networks are purposely created for spread innovative practices: this case will be treated when discussing of the inner context. However, even if the presence of compatible organizations within the same context can foster the adoption and the diffusion of innovation, Jun and Weare (2011) underline how such a factor can be insufficient for avoiding diffusions with shallow patterns.

Although inter-institutional dynamics represent key determinants, the necessity of studying innovation as a context-specific phenomenon has to be stressed. A portion of empirical studies explores the relationship between innovation characteristics and innovation adoption in public organizations, on the wake of the studies on diffusion of innovations by Rogers (2003): he stresses how an innovation that can be moulded (in order to fit with the specific circumstances and local practices that are relevant for a possible adopter) has a greater chance of being adopted. Innovation characteristics can act either as drivers or as barriers. Among the others, the complexity (Damanpour and Schneider 2009) and the compatibility (Neo and Calvert 2012) of the innovation itself are important factors.

5.1.2. Economic Factors

First of all, a positive association seems to exist between the wealth of the community involved and the likeliness of innovation: this is true both for the adoption *per se* (Ahn 2011; Manoharan 2013; Sapat 2004) and for the diffusion (Bhatti et al. 2011) of ICT-driven innovations. In this sense, Hall (2007) sustains the existence of a positive correlation among innovation capacity resources, actual innovations, and overall state economic performance. Furthermore, economic growth and employment have been proved to be facilitating factors by Nelson and Svava (2012) on a study focused on the adoption of e-government practices in US municipalities. Moreover, Rodriguez Dominguez et. al. (2011) – analysing the national governments of 192 countries worldwide –

emphasize the positive influence of economic development (country's GDP) and of significant fiscal capacity on the development of e-government.

Nyirenda and Cropf (2010) find how an unfavourable investment climate and market structures can impede the implementation of ICT-driven social innovation, especially in developing countries: as underlined by Mendes et al. (2012) in their works for the TEPSIE project, structural economic barriers (e.g. economies of scale, sunk costs) have to be taken into account in studying social innovations. Some studies however indicate that the adoption of innovation appears to be positively associated with the presence of budget constraints (Lonti and Verma 2003).

5.1.3. Social factors

Several scholars have emphasized the relevance of specific social and cultural factors (e.g. Dunleavy, Margetts, et al. 2006; Nyirenda and Cropf 2010; Cleland et al. 2012; Nabafu and Maiga 2012). Population's education seems one of the most important (e.g. de Guzman and Jones 2012; Pollitt and Dan 2011), both for ICT-driven social innovations and for NPM reforms in general. The study of McNeal et al. (2007) is an apt example: it analyzes the diffusion of e-disclosure practices in the US across 50 states and demonstrate that greater levels of legislative professionalism, education, and state resources can support greater levels of implementation in e-disclosure policies. The positive role of education is also stressed by Reddick and Norris (2013) in their study on the adoption of e-services in US grassroots (or local) government. Similarly, Rodriguez Dominguez et. al. (2011) argue that e-government development is positively influenced by citizens' cultural well-being.

In the observation of social environments in their wideness, stakeholders (and citizens in general) have to be considered as crucial players in determining the adoption and diffusion of innovation (e.g. Kamal et al. 2011; Oliveira and Welch 2013; Sapat 2004; Pollitt and Dan 2011), especially with respect to their trust *vis-à-vis* public institutions (e.g. Nu'man 2012; Grimsley and Meehan 2008; Papadopoulou et al. 2010; Voolberg et al. 2014). For instance, stakeholders' trust has proved to be crucial in the adoption of e-government by the South Korea's Supreme Court Registry Office (Kim et al. 2007). Trust-building is thus a desirable effort, that can be also facilitated by third party intermediary organizations: reductions in the technical divide and improvements in the accessibility to public services are among the achievable outcomes of such intermediations (Al-Sobhi et

al. 2012). Yet, not just trust-building, but also coercion (Alatawi et al. 2013) and obligation (Ghani and Said 2010) can influence the organizational willingness to adopt innovation. Moreover, not just the citizenry, but also providers and suppliers can be critical in adopting innovations (Ask et al. 2008; Kassim and Hussin 2013; Romzek and Johnston 2005; Walker et al. 2013): e-invoicing is a notable example in this sense.

Public opinion's behaviors and preferences deserve great attention as well. This is remarkably true for co-created social innovations: citizens' willingness, awareness and feeling of ownership – together with the level of social capital – are key elements in this sense (Voolberg et al. 2014). Dimitrova and Chen (2006) mention civic-mindedness as important for adopting e-government social services, together with interpersonal communication and mass media channels. Among the most noticeable contribution, Walker et al. (2011) can be also mentioned, who have analyzed the diffusion of policy innovations in 336 English local governments over four years (2001-2004): their findings highlight how both high and low innovative jurisdictions are strongly influenced by user demands, and the consequent degree of responsiveness *vis-à-vis* such requests. High innovative organizations primarily respond to their main stakeholder, which is central government, and they do not search for innovative ideas from other institutions. Low innovative organizations can be instead characterized as reacting subjects. In any case, responsiveness with citizens' pressure is a highly significant determinant of adoption and diffusion of innovation.

In conclusion, public pressures and need-based demands for services and ICT infrastructures trigger diffusion dynamics (Walker et al. 2011; Bhatti et al. 2011; Kalu 2007). For instance, the adoption can be favored by the (actual or perceived) demand for online communication and services (Jun and Weare 2011) and by the citizens' involvement in public decision-making (Sapat 2004). Policy makers should be responsive with respect to such necessities: when population's social needs become long-lasting, "social traps" that inhibit innovation can emerge because of path dependent dynamics (Mendes et al. 2012).

5.1.4. Political factors

Several political factors emerge as influential: such elements encompass – for instance – policy change-learning, norms, political competition, timing, mandate and responsibilities (e.g. Lee et al. 2011; Lonti and Verma, 2003; Ask et al. 2008). Ahn (2011) stresses the positive association between the adoption of e-communication applications in

U.S. Municipalities, citizens' involvement and the degree of political competition; at the same time, the adoption can be discouraged by the presence of traditional channels of political communication. Through a qualitative case study on pilot initiatives, Liptrott (2006) has instead investigated which factors influence the decision by English local authorities to adopt (or to not adopt) e-voting: his findings also include the political environment instigated by central government among these elements. Simultaneously, Rodriguez Dominguez and colleagues (2011) argue that (1) government reforms for improving administrative effectiveness and (2) governments with a majority in parliament influence in a positive way e-government development.

The form of government recurrently emerges as a determinant in the development of e-government and innovations in general (Reddick 2009b; Reddick and Norris 2013; Walker 2013). For example, a positive association exist between the adoption of innovation in U.S. municipal governments and the council-manager governments, both with and without an elected mayor (Nelson and Svara 2012). It has been also argued that decentralized countries adopt e-government faster than centralized ones (e.g. Gascó et al. 2013). As stressed by Pollitt and Dan (2011), the stability of governments itself has to be taken into account.

Legal aspects can be included among political determinants as well: as examples, laws and regulations (Cerrillo-i-Martinez 2011; Alatawi et al. 2013) and reformed jurisdictions (Rubin 1992) can be cited. On the one hand, Jaeger (2002) suggests that the US constitutional settings can turn out to be problematic in implementing e-government practices and – for this reason – the public decision-maker should take them into account. One of the main findings emerged from the WILCO project (cfr. Evers et al. 2014) – through the analysis of 77 welfare innovations at the local level in Europe – is the negative influence of large-scale uniform regulations on citizens involvement for co-creating innovations. On the other hand, a well-articulated legislation can promote innovation, as in the case of innovative pilot projects in the field of welfare at the state level (Rogers-Dillon 1999).

Finally, political support (Bouaziz and Chaabouni 2012; Kannabiran et al. 2008; Schwester 2009; Considine et al. 2009) is important for the successful implementation of ICT-driven innovations, while divergent priorities can act as barriers (Walker et al. 2013): Yun and Opheim (2010) argue that the adoption and diffusion of e-government in US states is more likely if their governors are institutionally powerful. Politicians can thus result

as inhibiting subjects with respect to realizing innovations (Mahrer 2005; Nyirenda and Cropf 2010). Furthermore, it is very interesting noticing how – internationally – political parties with sensibly different positions along the left-right spectrum attempt to promote the development of a dynamic and participatory e-government beyond their affiliation, at least at the municipal level (Gallego-Alvarez 2010).

5.1.5. Demographic factors

Numerous authors mention the size of the innovation context – expressed in terms of number of inhabitants – as a key demographic factor: the larger the population, the more likely the adoption and diffusion (Moon, 2002; Nelson and Svava, 2012; Pina, Torres and Royo, 2010; de Guzman and Jones 2012). Moon (2002) brings this evidence from the *2000 E-government Survey*: whereas 98 percent of U.S. cities with populations over 50,000 have their own Web sites, this percentage is roughly 79 percent for municipalities with populations of 10,000-24,999. It is also interesting to mention the contribution by Nelson and Svava (2012): population size, sunbelt location and higher population density emerge as positive features for the adoption of innovation. Nonetheless, the study of Brudney and Selden (1995) showed similar findings in large and small cities, irrespectively of size. Similarly Reddick (2009b) – in a more recent study on the adoption of centralized customer service systems in local governments in the USA – does not support the claim that larger cities are more likely to be adopters of this type of IT.

5.1.6. Technological factors

First, infrastructural capacity is critical in e-government implementation (Nyrienda and Cropf 2010; Karunasena and Deng 2012; Backhouse 2007; Nabafu and Maiga). Ghani and Said (2010), for example, studied the practice of digital reporting among Malaysian local authorities. Their findings show how the lack of IT facilities in these contexts is a deterring factor of the adoption. External IT support can thus be a useful tool to be employed (Alatawi et al. 2013). However, this is not always reflected in public policy. For example, Kyriakidou et al. (2012) argue that while the European Commission has issued a number of policy documents aimed at fostering information society and electronic government, more recently it has realized that a set of complementary measures was needed in order to facilitate a wider adoption of broadband services, such as the implementation of broadband networks. The authors then propose a metric that describes the maturity level of information society and, more specifically, the utilization of

communications network potential (UCNP). The related measures capture the enabling role of 'classical' technological determinants such as the use of e-government by enterprises or by individuals; broadband penetration, level of internet access for households and IT and communication expenditures. Interestingly, measures related to price of local calls or the market share of the incumbent in fixed telecommunications or the market share of the leading operator in mobile telecommunications, are also included to capture the likelihood that the technological network will be financially accessible for businesses and citizens or else prevented by unhealthy market concentrations.

Other studies further refine the notion that household access to the Internet is automatically translated into higher demand for e-government services. In their study on the adoption of e-disclosure laws, for example, McNeal et al. (2007) argue that the service or policy has to be salient among the general public to expect that the higher rate of Internet access is translated into higher demand. In this sense, the citizens' ICT readiness severely influences the success of e-government initiatives (e.g. Karunasena and Deng 2012). Information security is another important factor which can influence the adoption of ICT-driven innovation (Conklin 2007). Moreover, the scalability of technologies is another factor that facilitate the success of adoption (Kannabiran et al. 2008). In conclusion, investing great amounts of resources in e-government systems can ultimately turn out to be a meaningless exercise if technological infrastructures are absent.

5.2. Determinants and barriers referred to the inner context

5.2.1. Organizational factors

For introducing this review on organizational factors, it can be useful to recall a literature's milestone on the issue: Damanpour (1987) has studied the adoption of innovation in public libraries in six northeastern US states (serving populations of 50.000 to 500.000); its work shows how *different* typologies of innovations are *differently* impacted by *different* typologies of organizational factors. For example, he highlights how technological innovations are more impacted by organizational slack and specialization (that is, the variety of specialists and knowledge), while administrative innovations are more impacted by the organizational size and the administrative intensity (that is, the proportion of administrators within an organization and therefore an indicator of

management overhead). This first element is insightful with respect to the complexity of organizational environments in the adoption of innovation.

The presence of slack resources⁶ within the organization is surely one of the most recurrently mentioned factors in driving social innovation. Such a circumstance implies the possibility of allocating a share of resources to innovative activities (e.g. Moon 2002, Ahn 2011, Maranto and Wolf 2013; Wood et al. 2009). They can indeed sensibly vary in their nature: they include information, time, financial, technological and human resources. For instance, Bhatti et al. (2011) analyze the adoption and the diffusion of Citizens Service Centers (CSC) among Danish municipalities: their findings stress the importance of organizational wealth and capacity to foster such processes. Schwester (2009) – in analyzing the adoption of e-government practices at the local level – similarly argues how higher operating budgets, IT staff availability and technical resources are factors that positively influence adoption. With respect to the financial characteristic of the organization, factors like short-term budgets and planning horizons and silo budgeting can discourage the successful adoption and diffusion of ICT technologies (Berry 1994). As highlighted by various authors (e.g. Walker 2006; Walker 2013; Manoharan 2013, Fernandez and Wise 2010; Homburg and Dijkshoorn 2011; Ghani and Said 2010), the organizational size itself can be considered as a “slack”, thus contributing to the adoption and diffusion of innovation. On the contrary, Gianakis and McCue (1997) have noticed a negative association between innovation and the organizational size, since – according to their findings – smaller local governments in Ohio tended to be more innovative than larger governments.

In general, management characteristics play a remarkable role (e.g. Damanpour and Schneider 2009; Reddick 2009b). Mulgan and Albury (2003) emphasize the importance of middle management as “knowledge engineers” as well as all people within the organization that act as “knowledge intermediaries” (Behn, 2008): in this intermediation, public managers have to bring specific competences that go beyond pure ICT skills because of the organizational impact of innovation (Hunnius and Schuppan 2013). Such an organizational attitude has been also defined as “organizational learning” (e.g. Asoh 2002; Kim et al. 2007; Kassim and Hussin 2013). As suggested by Walker (2013), organizations that promote social interaction and collaboration foster organizational learning, with a positive effect on the adoption of innovation.

⁶ It is worth noticing that slack resources in public service organizations are also strongly connected to the outer context.

Scholars have also stressed the role of full-scale management capacity (Kim and Lee 2009) and innovative leadership (Koga 2003; Kalu 2007; Kifle et al. 2009; Bekkers and Homburg 2005). A proper leadership style can thus be supportive through the clear definition of goals, strategies, risks and incentives (e.g. Azab et al. 2009; Boudry and Verdegem 2012; Voorberg et al. 2014; Whitmore and Choi 2010). With respect to this, elements that foster motivation and skills of “internal” actors are incentives for efficiency and innovation preparedness (Korteland and Bekkers 2008). The issue of organizational leadership deserves specific attention: because of the nature of public organizations, not just managerial leadership, but also political one is a determinant of adoption (e.g. Furuholt and Wahid 2008). Yet, a clear distinction between administrative and political responsibilities is necessary for the successful adoption of innovation (Ask et al. 2008). The staff turnover itself can ease the adoption of ICT-driven innovations (Rajapakse 2013). Nonetheless, Chen (2010) – in a study on the implementation of citizen-centric e-government services – underlines how managerial capacities play a minor role in these processes, while stressing the importance of embedding citizens’ feedback in devising services and the overall organizational commitment.

A consolidated culture of risk aversion and reluctance to close down failing programs or organizations do not enable the organizations to innovate radically and systemically (e.g. Albury 2005; Pollitt and Dan 2011; Borins 2008). Thenint (2010) – in investigating how to promote public sector innovation and diffusion within 300 government reformers in the U.S. and Commonwealth countries – identifies bureaucratic attitude as a potential barrier to be overcome. More broadly, sociopolitical aspects *within* the organization (e.g. relational capabilities, clear responsibilities, sound governance mechanisms) are mentioned as important factors in favoring innovation (Janssen 2012). For instance, the adoption of innovative arrangements in Italian Local Public Utilities (LPUs) seems to be positively associated with the relational capital within the board of director (Monteduro et al. 2011).

In the analysis of the outer context, the central role played by inter-institutional dynamics has been highlighted. As anticipated, such phenomena can be “institutionalized” for the creation of inter-institutional networks and collaborations. Networks around the best (Mulgan and Albury 2003) and lateral networks (Albury 2005) can encourage system-wide innovation, and more effective and rapid diffusion. Also collaborations with nonprofit organizations can ease such a process, especially in social innovation (Manoharan 2013;

Mendes et al. 2012). With respect to ICT-driven innovation and e-government, two or more organizations can collaborate to reach systems' interoperability and services' integration. For instance, Brown et al. (1998) have demonstrated that a positive association exists between the adoption of technological innovation and the presence of inter-organizational collaborations, even if the number of partners involved negatively affects the adoption itself. Nonetheless, Ferro and Sorrentino (2010) present different conclusions in studying the possible implementation of e-government in Italian peripheral areas: the role played by inter-municipal collaborations for translating decisions (taken at the central level) into concrete commitment by involved municipalities is negligible – they state. Not only collaborations among institutions, but also among professionals is a remarkable antecedent: Yun and Opheim (2010) stresses how US states whose leaders are engaged in professional networks more likely adopt e-government practices, while Reddick (2009) stresses the importance of collaborations within city governments to foster the effectiveness of e-government in US cities.

For concluding this reflection on organizational factors, the context-specific nature of innovation has to be underlined again. As underlined by various authors (e.g. Rogers 2003; Nurdin et al. 2012; Ventura 1995; Voorberg et al. 2014; Davies and Simon 2013) this is a necessary to suit the innovation to the specific context. In their in-depth reflection on the study of public sector innovation, Osborne and Brown (2011) emphasize the multifaceted nature of innovation: such a complexity has to be understood when public policies are elaborated and implemented, and this implies the development of managerial competences that can adapt – case by case – innovation to specific and contingent purposes.

5.2.2. Individual factors

In treating individual factors, a premise is necessary: in literature, there is not a clear cut in distinguishing individual and technological factors of the inner context. In particular, this division is rather blurred for what regards ICT skills and capabilities of employees, since they are factors referred both to individuals and to technology. However, for definitional clarity, we pose it that ICT elements referred to individuals are treated as individual factors, while we refer to technological factors as those elements that regard the organization as a whole, beyond its single employees. This means that we focus on organizational – rather than individual – determinants referred to technology.

First, employees' perceptions seem to play a major role in shaping the possibilities of innovation (e.g. Palmer and Dunford 2001; Carr and Gannon-Leary 2007; Ahn 2011). For example, the role of perceptions is stressed by Cassell (2008), which has analyzed the adoption of open source software in four European city through semi-structured interviews: the perception of improving independence, effectiveness and cost saving are the most relevant determinants emerged. Similar findings are presented in the work of Nedović-Budić and Godschalk (1996), that analyze the adoption and the diffusion of Geographic Information Systems (GIS) in four agencies of a North Carolina county government: the relative advantage perceived by employees in adopting such a technology is an important determinant, together with their previous computer experiences and their exposure to technologies. Chen and Gant (2001) instead emphasize the possibility of improving efficiency. In this sense, Manoharan (2013) underlines how employees' support is vital in the adoption of ICT in US counties. In this sense, the ease of use and the perceived usefulness are crucial for employees' adoption (Stamati and Martakos 2011; Hung et al. 2009): technology and its role within the organization have to be understood by the employees in order to facilitate its implementation (Ventura 1995).

With respect to employees' characteristics, their autonomy is considered an important determinant (Lonti and Verma 2003; Walker 2006; Tummers 2011). According to Fernandez and Wise (2010), attention has to be paid also to the disposition and the behavior of organization's leaders. Voolberg et al. (2014) also stress the attitude of public officials as an influential factors in both accepting and refusing citizens' contributions to co-create social innovations. de Guzman and Jones (2012) has instead analyzed which factors can influence the characteristics of police websites, using 162 US large municipalities as a sample: officers' education emerge as the most relevant predictor. Berry et al. (1998) have subdivided the individual managers' characteristics in dispositional factors (e.g. age, attitude toward technology) and capability factors (e.g. education, training, possession of a PC): these emerge as determinants in adopting a computer-based expert system by managers in the Florida Department of Highway Safety and Motor Vehicles (state agency).

Perhaps not surprisingly, professionalism and skills of public personnel are influencing factors that recurrently emerge in reviewing the literature (e.g. Damanpour 1987; Bhatti et al. 2011; Sabet and Klingner 1993, Sapat 2004; Teodoro 2010). As emphasized by Ghani and Said (2010), inadequate specialized staff can act as an

obstacle to adoption. For this reason investing in human capital is a vital challenge: as stated by Autant-Bernard et al. (2010), human awareness and capacity of using new technologies is a condition for their adoption, and investment in human capital may facilitate the absorption of these distant technologies. This introduces the issue of technological readiness displayed by individuals, such as employees' ICT technological skills and capabilities (Nurdin et al. 2012), e.g. their ability to use existing computers' applications (Manoharan 2013). For example, the existence of ad-hoc training and possession of a PC are enabling factors (Berry et al. 1998). Other studies characterize readiness in terms of experience, for example previous computer experience, previous exposure to technology and networking (Nedović-Budić and Godschalk 1996), technological maturity (Gasmelseid 2007) and specific years of e-government experience (Reddick and Norris 2013). This experience can be passed not only through training (Hung et al. 2009; Kalu 2007) but also in the form of practical guides (Gil-Garcia and Pardo 2005). As stated by Moon (2002) in his often-quoted study, the lack of technological readiness is among the main barriers to ICT-driven innovations among municipal governments in the US.

However, not only skills, but also employees' commitment has to be taken into account (e.g. Kim and Lee 2009). Such a commitment is observable in the eventual willingness to participate (or, on the contrary, in the resistance to change): for this reason, innovative culture has to be encouraged by the presence of flexible and adaptive managers (Berry 1994) that have a positive attitude toward change (Damanpour 1991; Stylios et al. 2011). The issue of employees' commitment is even more relevant in the case of innovations driven by ICTs: studies find a positive association between the adoption or diffusion of ICT-driven innovations and their acceptance, that is to say the attitude towards the technology of employees and managers (e.g. Reddick 2004).

5.2.3. *Technological factors*

Technological factors score high among the determinants of ICT-driven innovation. First, the intrinsic features of innovation fit squarely with the technological factors that favor or hinder the diffusion of innovation. For example, Ahn has included the nature of the IT application among the determinants of innovation, concluding in his study that application with high communication impact are associated to a general disinclination to adopt e-government (2011). Similarly, technological compatibility has been considered a predictor

of users' intention to utilize EDMS - electronic document management systems (Hung et al. 2009) or complexity in the standardization process and in the digitalization of operations has been included in the barriers to adoption (Raus et al. 2009). Parajuli (2007) – in analyzing e-government in Nepal – stresses the importance of specific elements related to government websites, such as their transparency, interactivity, accessibility and usability, while Nu'man (2012) mentions security, usability, privacy, audit, reliability and equity of access as key factors for the adoption of e-voting in Jordan. The role of security and reliability is a recurrent factor in several ICT-driven innovations, especially those concerning sensitive aspects of end-users' life: e-voting (Liptrott 2006) and interoperability (Gascó et al. 2013) are noticeable examples in this sense. The scale of innovations is another important element: within the context of the LIPSE project, Voolberg et al. (2014) have conducted a comparative case study also dealing with the influential factors of co-creation in two social innovation contexts. Their findings demonstrate how the scale of such innovations has to be adequate, i.e. large enough to ensure a variety of resources, small enough to ensure coordination.

As seen before, ICT readiness and acceptance displayed by employees have been classified as individual factors. However, the organization as a whole can display variable degrees of readiness as well: for example, the technological readiness of an organization is signaled by the existence of an IT department (Reddick and Norris 2009) or, more specifically, by its positioning within the organizational structure of a public administration (Cassell 2008). Some studies refer to readiness as the IT capability of government agencies to identify the key pieces of technology (Chen and Gant 2001). Also Connolly (2007) treats the issue of ICT readiness while analyzing the adoption of the Irish Revenue On-Line Service (ROS) site, which an online tax filling system: public institutions have to be able to handle large surges in the number of transactions at certain times of the year, in order to guarantee the proper functioning of this e-service. As underlined by Gascó et al. (2013), the technological readiness of the organization can be observed in objective elements such as the number of computers or the Internet/Intranet availability; beside this, also the importance of information system compatibility cannot be neglected.

Finally, we can mention the contribution of Contini and Cordella (2007), who have analyzed e-justice practices in Italy: they interestingly highlight the necessity of considering ICT-driven innovations not just in their technological aspects, but in a holistic way, that means, also taking into account their social spillovers. In this sense, developing

sophisticated ICT infrastructure is ultimately a meaningless exercise if barriers at the organizational level are not surpassed. A managerial approach that brings together social and technical priorities is thus necessary. This aspect of e-justice has been also treated by Gascó and Jiménez (2011) through an empirical study on the e-government initiative “e-Justícia.cat”, implemented in Catalonia. The findings show that – albeit ICT-driven change and innovation is likely to generate resistances – training and communication have been crucial in the change management strategy. The existent relationship between technologies and organizational factors has to be taken into account when developing ICT-driven innovation (e.g. Felipe Luna-Reyes and Ramon Gil-Garcia 2011).

5.3. E-procurement

The importance of this ICT-driven innovation is stressed by Cattaneo (2012), who affirm that «e-procurement is a text-book case of the barriers preventing the scaling up of innovation by public administrations, even when benefits are clear and technologies are mature. [...] However, there is evidence that, in some EU countries, mandatory regulation on e-procurement has been able to overcome these barriers and trigger fast change».

Determinants from the outer context are firstly analyzed. Rivera Leon et al. (2012) stress that the agreement in government to transfer public procurement to the electronic environment as a priority is a powerful driver; the same can be affirmed for the observance of regulations and administrative dispositions. In some cases, however, the legal framework is adapted to the traditional processes, thus frustrating the upscaling and diffusion of e-procurement: the legal controls risk to create excessive constraints (Hawking and Stein, 2004). Security is a major concern when working on the Internet: Rankin (2006) shows that this is one of the technical issues with e-procurement still to be fully overcome. Although security measures have been developed and the banking institutions are satisfied with the level of security, this study shows that this is one of the most significant barriers to e-procurement uptake. The security of transaction (Gebauer et al., 2008; Eadie et al., 2007) creates relevant concerns about the realization of real benefits of e-procurement. From empirical evidences, the relations with third parts (suppliers) can be revealed as a barrier: Hawking et al. (2004) identified the lack of business relationships with suppliers showing the need for an e-procurement enabled supply chain as another barrier for the implementation of e-procurement. Also in the in the case of e-procurement,

users' attitudes, mimetic pressure and suppliers' expectations can play a relevant role (Kassim and Hussin 2013).

The determinants referred to the inner context are now analyzed. The most recurrent drivers for the e-procurement diffusion relate to the economic/technical factors as the reduction of administration and operational/inventory costs (Hawking and Stein, 2004) and the reduction of procurement process costs (to enhance efficiency and productivity) for public buyers (Cattaneo, 2012). At the same time, the financial resources and the costs for the implementation and the diffusion are crucial barriers for many organizations (e.g. Cattaneo, 2012; Wong and Sloan, 2004; Hawking and Stein, 2004). A vast literature espouses the benefits of e-procurement solutions (e.g. Minahan & Degan, 2001) like the spread of improved market intelligence, enhanced decision making and shortened procurement cycle times. In general it is visible the increased accuracy of production capacity and the improvement of management.

The lack of IT infrastructure, technical expertise and competencies (Bof and Previtali, 2007) is present within the organizations, as well as complexity and lack of user-friendliness, lack of awareness about e-document and digital signature and unwillingness to adopt the new system (Rivera León, Simmonds and Roman 2012). Most of the obstacles arise from the complexity of organizational innovation in the public sector and the difficulty to scale-up ICT-based innovations from a marginal to a central role. For example, this can be determined by inertia and fear of change, low incentives, lack of awareness and the difficulty to manage transition related to the burden in maintaining double process (paperbased and electronic) (Cattaneo, 2012). In this sense, organizational learning is crucial for the success of e-procurement initiatives (Kassim and Hussin 2013), and also the ability of recognizing such an innovation as disruptive, rather than as sustainable (Barahona and Elizondo 2012).

The lack of human capital also play a relevant role. Gebauer et al. (1998) state that a lack of top management support and vision «cannot be simply solved by a fast Internet connection or yet another departmental reorganization». It is pointed out that resistance to change is one of the biggest barriers to the introduction of e-procurement within the public sector (Eadie et al., 2007). The regulatory-administrative factors refer for example to the onerous requirements (particularly for bidder authentication, new litigation threats) for the public suppliers but also for the suppliers (Cattaneo, 2012).

5.4. Telework

One of the main risks connected to telework (like other workplace innovations) is to be restricted to mere pilot projects without a clear strategy for the diffusion of the innovation throughout the organization as a whole (Reichwald and Möslein, 2000). In the analysis of the *outer context*, concerns regarding IT data security emerge, similarly to the case of e-procurement innovation (Booz-Allen Hamilton, 2002). Connected to this, the study of Unguream (2007) pinpoints that technological factors like telephone net capacity, connection and transfer speed, telecom liberalization and the ease of use may be conducive to telework innovations. Another determinant has been identified in the perceived external pressure exerted by the public opinion towards higher levels of quality and quantity of services which, in turn, may result in more flexible forms of work (Lonti and Verma 2003). Lastly, from the society point of view, on the long run it will see reduced traffic congestion and emissions, emergency preparedness (i.e. pandemic response) and reduced infrastructure impact in urban areas.

With regard to the *inner context*, the Georgetown University Law Center in "Telework in the Federal Government: The Overview Memo" (2009) distinguishes among three actors: the company, the employees and the society. For the company, telework is a tool for recruiting and retaining talented employees and to increase productivity. Through this innovation, the business can ensure continuity of business operations during an emergency and decreasing costs for office space. The employees see benefit from a better work/life balance, improved morale, and reduced commuting and transportation costs. Additional benefit is for example the autonomy and flexibility over work schedule (Hamilton, 2002). Yet, the barriers to the successful upscaling and adoption of this ICT innovation are numerous, such as technological barriers (e.g. system performance and teleworkers' access to equipment, services and technical support) (*ibidem* 2002). In addition, teleworkers receive little or no training for telework. Since telework implies a significant reshaping of organizational settings, the lack of formal job definition and the importance of the group are mentioned as barriers to its adoption (Mokhtarian and Sato 1994).

Like in the case of e-procurement there are economic barriers as funding issues and the need for making telework a regular/frequent practice, in order to consolidate office space and reduce costs. If an agency uses telework only sporadically, the agency cannot reduce its office expenses reliably (Georgetown University Law Center, 2009). As we

stated at the beginning and for the first type of ICT innovation described, human capital can play a relevant role. Unguream (2007) identifies the company culture as a possible obstacles related to the organization. In the upscaling of this innovation there can be difficulties in fostering team synergy, in monitoring employees' performance, together with possible negative effects on workplace social network (Hamilton, 2002). A management style that associates physical presence with performance can hinder the adoption of telework within public organizations, as well as a lack of universal understanding or recognition by employers of the potential monetary advantage presented by support for telecommuting employees. The research commissioned by the Australian Government Department of Broadband, Communications and the Digital Economy (2012) underlines how telework is a concept associated with low levels of awareness and moderate levels of skepticism from employers and employees.

5.5. Focus on upscaling

As expected, the findings show how the literature on upscaling of innovation in the public sector lacks of both a systematic conceptualization and solid empirical evidences. Nonetheless, the scarcity of contributions does not indicate the irrelevance of this issue in the real world: longer-term effects of innovation are ensured by upscaling processes. The diffusion of innovations is sometimes “spotty” and characterized by shallow patterns (Jun and Weare 2011): in this sense, upscaling is critical to achieve a “critical mass”. As showed in the [Section 3.4](#) (cf. *Figure 2*), only three works on this issue have been found for developing this theoretical framework. Despite its slenderness, providing a punctual picture of this scant literature analyzed can be useful.

Davies and Simon (2013) have developed a literature review on the growth of social innovation as a deliverable of the TEPSIE project. The issue of “scaling up” is explicitly treated in the third chapter (*ibidem*: 8-28). The greater focus is on the third sector, but also the public one is taken into account: «this chapter ends with a consideration of how appropriate the language of scaling is for understanding the spread of social innovations, understood in the broadest sense to include innovations that emerge in the public sector and the community sector» (*ibidem*: 4). For our purposes, the most relevant findings regard:

- *Reinvention and adaptation*: whereas upscaling of innovation in the private sector is successful as long as products can be standardized, contexts' peculiarities are instead

crucial in social innovation. This is evident for public services, where the concepts of “personalization”, “empowerment” and “co-production” all underline the need of “relational” public organizations;

- *Political aspects*: upscaling innovation in the public sector is also connected to political determinants. For example, scaling up can easily create claims for power and resources.

Another pertinent work is the one by Mulgan and Albury (2003). The definition of upscaling we have offered here is indeed taken from their paper (cf. [Chapter 2](#)). As the authors stress, the success of innovation lies on how many organizations adopt it, rather than on the presence of few (even if excellent) “champions”. In this sense, only a small portion of ideas and pilots deserve to be replicated: in such a decision, governments have usually adopted two instruments: (1) law, central direction and administrative command; (2) dissemination of evaluations of pilots, case studies and best practice. Both these tools have sometimes proved to be insufficient or inadequate for upscaling, since they are characterized by an implicit “idea-push” model of innovation. “Pull” factors can instead drive to a greater success: they include various typologies of incentives (e.g. quasi-market dynamics, identification of “beacons”), peers’ networks and change management.

Finally, the other work which treat the issue of upscaling is specifically referred to electronic procurement (Cattaneo 2012). The main determinants and barriers that emerge from it have been exposed in the [Section 5.3](#). In general, attention is paid in investigating the barriers to upscaling: they usually emerge from the public administration itself (i.e. organizational inertia, resistance of concerned actors such as public buyers, legal constraints, lack of interoperability and scarce awareness of benefits) and they create difficulties in scaling up ICT-based innovation from a marginal to a central role.

5.6. Focus on types of adopters

The analysis of determinants and barriers by clusters of adopters is critical not just for WP5’s purposes. This means distinguishing specific influential factors for each type of adopter (i.e. pioneers, followers, late adopters, laggards), as suggested by the theories on diffusion of innovation. For example, Rogers (2003) underlines the importance of short-term, visible and concrete benefits as drivers for diffusing innovation. Unfortunately, the literature reviewed for the WP5 Theoretical Framework provides almost no insights with

respect to this issue in the field of public administration: influential factors are virtually not distinguished for the specific target groups mentioned before.

Nonetheless, it is worth noticing how inter-institutional dynamics (namely isomorphism) emerge – by their *own nature* – as prominent determinants of late adoption and diffusion. Mulgan and Albury (2003) suggest that the discover and prototyping of innovation have to be followed by strategies for replicating and diffusing it: competition and mimicking are antecedents properly referred to followers, late adopters and laggards rather than to pioneers.

For the WP5's research scope, a fundamental contribution comes from Kwon et al. (2009) – whose work has been taken into account in this theoretical framework. The authors investigate the adoption of economic development strategies by U.S. local governments, paying specific attention to the *timing* of such an adoption. They explicitly state: «This research considers two questions. First, what factors influenced early and late adopters of strategic economic development policy tools, and second, how are the factors that influence policy adoption in the latter period of time different from the factors that influence early adoption?». In order to cluster the factors per type of adopter, their statistical analysis is based on government data in the timespan 1999-2004. For WP5's purposes, the most relevant findings can be summarized as follows: (1) with respect to the form of government, later adopters are much more likely to be mayor-council cities than are the earlier adopters, which instead are more likely to present the manager-council form; (2) early users are more likely to be involved with business partners, they present greater levels of professionalism and capacity for economic development, and they use computer IT more than the others; (3) moreover, early adoption is more likely to regard larger cities; (4) finally, the work also confirms the prominent role of isomorphism in diffusing innovation.

6. Research implications

This work investigated the determinants and the barriers in adopting, diffusing and upscaling ICT-driven social innovations within the public sector. Furthermore this review has also the objective of providing WP5's future empirical analyses with a consistent theoretical framework: for this reason, summarizing the most significant and/or critical elements emerged can be supportive in empirically investigating the determinants and the barriers of ICT-driven social innovation in the public sector. More specifically, such analyses are going to be conducted with respect to e-procurement and telework. Therefore, the main implications can be summarized as follows:

- The upscaling of ICT-driven social innovation within the public sector is a phenomenon that still lack of both clear theoretical insights and abundant empirical evidences. Nonetheless, the three contributions identified in this literature review (Davies and Simon 2013; Mulgan and Albury 2003; Cattaneo 2012) represent a first valuable basis for developing future analyses. Overall, upscaling is conceptualized as a process that lead innovation to fully generate its social benefits through its homogeneous diffusion across a specific context. The main determinants connected are: (1) adaptation processes; (2) political conflicts; (3) incentives at various levels; (4) inter-institutional networks; (5) change management; (6) organizational inertia and/or resistance; (7) legal constraints; (8) lack of interoperability; (9) scarce awareness of benefits.
- The literature reviewed is scant also with respect to the types of adopters (i.e. pioneers, followers, late adopters, laggards), although the theories on diffusion of innovation (e.g. Rogers 2003) strongly emphasize this issue. Yet, some insights can be provided taking into consideration the few pertinent works reviewed (e.g. Mulgan and Albury 2003, Kwon et al. 2009). With respect to earlier adopters, the specific (positive) determinants emerged are: (1) city size; (2) economic development capacity; (3) the manager-council form of government; (4) involvement with business partners; (5) professionalism of public officials; (6) use of computer IT. With respect to late adopters, the main influential factors are: (1) the mayor-council form of government; (2) isomorphism. Particular attention will be paid to these factors in developing WP5 empirical analyses, which will seek to more completely cluster determinants and barriers on the basis of the type of adopter.

- With respect to influencing factors of the *outer context*, the literature describes the possible determinants and barriers in a rather clear manner (e.g. inter-institutional dynamics, wealth of the community, population's size and education, role of stakeholders, political and legal aspects, ICT readiness at national and sub-national levels). This will permit a simpler inclusion of such antecedents in the empirical investigation.
- The large predominance of an Anglo-Saxon perspective in the literature examined (both as a research tradition and as a geographical focus of analysis) requires paying attention to certain specificities that belong to the European context, such as the state and governance traditions (e.g. Loughlin and Peters 1997; Pollitt and Bouckaert 2011) and to the specific regional or local authority investigated.
- The cross-country and comparative nature of WP5's empirical analyses is likely to produce useful insights in this direction: a context-specific perspective is adoptable, thus enabling an in-depth examination of those antecedents from the outer context that vary depending on the country considered.
- With respect to the *inner context*, the overall picture appears blurrier, mostly because of the various overlaps encountered in distinguishing the various determinants and barriers. This is particularly evident for those factors that are simultaneously *individual* and *technological* in nature (i.e. employees' ICT readiness, skills and capabilities, technological acceptance).
- Such an aspect has two main implications: (1) future research works have remarkable margins for further developing clear distinctions among such determinants, investigating – for example – how ICT skills and other kind of skills (e.g. professionalism) differently impact on diffusion dynamics; (2) WP5's empirical analyses can bring a fundamental contribution in this sense as long as this distinctions are kept in mind by the researchers.
- The findings, as anticipated, highlight the complexity of determinants: the same factor can be both a driver and a barrier or instead act in a univocal direction; this seems to

depend on various elements such as the institutional context, the stage of the process and the nature of the innovation itself. This has to be taken into account since e-procurement and telework are both ICT-driven innovations, but they are diverse in their intrinsic characteristics: the same determinant can act as a facilitator for one innovation and as a barrier for the other one. For example, privacy concerns are likely to hinder the adoption of e-procurement, but it may favor telework practices because of their “home-dimension”.

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