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Between bricolage and breakthroughs – Framing the many faces of public sector innovation

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Abstract

Public sector innovation is often seen through the lens of private sector frameworks. This paper discusses to what extent the innovation typology derived from the private sector is appropriate for public sector contexts. Based on classification of 1536 examples of public sector innovations, the paper finds that a considerable share was best classified as bricolage or incremental change, while many others encompass multiple types of innovations and systemic innovations. The paper argues that measurement frameworks should better reflect this heterogeneity of learning and innovation in the public sector.

Keywords: public sector innovation, bricolage, systemic innovation, measurement

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..it is a serious mistake to treat an innovation as if it were a well-defined, homogeneous thing that could be identified as entering the economy at a precise date – or becoming available at a precise point in time.. (Kline and Rosenberg 1986:283 in Fagerberg 2005)

Introduction

While innovation has traditionally been studied in the private sector, throughout the last decade public sector innovation has gained increasing interest (UK Department of Business, 2008; European Commission, 2010, 2011, 2013; OECD 2010, 2012). There is also growing recognition that much innovation is taking place in the public sector (Borins, 2001; Koch and Hauknes, 2005; Windrum, 2008). Increasing pressures on public budgets following the current economic crisis in Europe as well as demands to address grand societal challenges have further heightened interest in innovation in the public sector (European Commission, 2011; Kuhlmann and Rip, 2014).

A solid and shared understanding of what innovation in the public sector is and how the public sector perceives it is vital both to research on the characteristics of public sector innovation and to the development of measurement frameworks.

In order to grasp the nature of public sector innovation, there have been several efforts towards developing indicators and frameworks for measuring innovation in the public sector (Gallup Organization, 2011; Hughes and Baker, 2011; Arundel and Hollanders, 2011; Bloch and Bugge, 2013). These pilot surveys have tended to follow a pragmatic approach by taking as a point of departure the measurement framework originally developed for the private sector. Moreover, the surveys have reported extremely high innovation rates for public sector organizations, often surpassing the innovative shares for the private sector (Arundel and Huber, 2013). This has caused great uncertainty concerning how the notion of innovation should be defined, understood and measured in the public sector (Arundel and Huber, 2013; Bloch and Bugge, 2013).

These patterns motivate examining more closely whether the approach taken in the measurement frameworks is adequate in reflecting the nature of innovation in public sector services. Against this background, this paper presents the results of a follow-up study to one of the pilot surveys analyzing the qualitative examples of innovations collected in various public sector organizations. As such, this paper aims to contribute to improve our understanding of the notion of innovation in the public sector, and also to bridge scholarly traditions across public policy, innovation studies and measurement. Based on qualitative analysis of more than 1500 examples of public sector innovations, the paper explores the many faces of public sector innovation spanning from learning activities and bricolage, via more 'traditional' innovations, to systemic breakthroughs. The paper finally reflects on the implications of the classification exercise for how public sector innovation can best be measured.

The paper is structured as follows: Section two outlines approaches to conceptualize the characteristics and objectives of innovation in the public sector. Here, theorizing on innovation in services and on the notion of bricolage and systemic innovations is central. Section three presents efforts at developing frameworks for measuring innovation in the public sector, and uses some results

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from the MEPIN study (Measuring public sector innovation in the Nordic countries) as entry points to the present study. Section four describes the methodology applied, while section five presents the results from the classification exercise. Section six discusses implications of the results and concludes.

Approaches to the heterogeneous ecology of public sector innovation

Various approaches and scholarly contributions have improved our understanding of the characteristics of and conditions for public sector innovation, spanning from theorizing on the notion of bricolage via the nature and characteristics of innovation in public services (Djellal et al., 2013), to a focus on objectives and outcomes of public services (Kelly et al., 2002), and how these hold implications for innovation.

Innovation processes - from the collection of new ideas to the implementation of fully developed innovations - can be perceived in many ways. Innovation can be seen as the result of intentional actions (Koch and Hauknes, 2005) and be the result of a planned systematic process that is often expected to be implemented in a given context (OECD, 2002). Others have emphasized how innovations may also be unexpected outcomes and accidental by-products of developmental processes (Osborne and Brown, 2011).

The service innovation literature (e.g. Gallouj and Weinstein, 1997) has argued that many service innovations are often developed through work with a particular customer and thus can be more of an ad hoc nature. Incremental learning and change often occur through interaction between the producer and the consumer of public services. Stemming from this line of work, the notion of ‘bricolage’ refers to small, bottom-up and incremental changes often initiated by front line employees in public service provision (Fuglsang, 2010). Ad hoc innovations have been argued to be of particular importance in the public sector (Fuglsang, 2010).

Innovation can also be seen as the result of a lengthy process involving many stages and interrelated innovations (Fagerberg, 2005). Incremental changes can often be integrated with more formal (top-down) innovation and more systemic or radical breakthrough innovations (Garud and Karnøe, 2003; Moore, 2005; Fuglsang and Sørensen, 2011). The cumulative impact of incremental learning and innovations is regarded to be just as great as radical innovations and that ignoring these may lead to a biased view of long run economic and social change (Lundvall, 1992). Accordingly, incremental learning and development work should be considered as an important element of the wider innovation ecosystem (Moore, 2005).

Whereas some innovation activities will be oriented towards adoption and finding best practice within given organizational boundaries, other innovation activities will be more geared towards exploration and novel (societal) solutions across public, private and civic realms. Moore and Hartley (2008) emphasize the importance of innovations that transcend the boundaries of individual public organizations. By such systemic innovations they refer to “...innovations that change production systems that cut across the boundaries of organizations...” (Moore and Hartley, 2008, p 18). In this sense, innovations in governance are seen as “designed to re-shape a broader social system”. There

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are generally far greater challenges in developing and implementing radical (systemic) changes, which often involve changes to socio-cultural and socio-economic factors in existing production regimes (Geels, 2002, 2014). While all innovations can be seen as the result of a dynamic process, both bricolage and the systemic nature can be viewed as expanding the framework typically applied onto the dynamics of public sector innovation.

Another way to understand the heterogeneity of innovation in the public sector relates to the diverse objectives and outcomes of public sector services; e.g. offering high quality services towards citizens, offering efficient services to the private sector, boosting innovation in the private sector, ensuring public values such as democracy, trust and safety. (Kelly et al., 2002; Bason, 2010), and finally the need for the public sector to address grand societal challenges (European Commission, 2011; Mazzucato, 2011; Head and Alford, 2015; Kuhlmann and Rip, 2014). In this sense one may say that the objectives for the public sector are more diverse and complex than for the private sector. Reflecting its societal and systemic characteristics, the diffusion of innovations across various public sector contexts is vital for the public sector, whereas for the private sector protection of innovation is more prevalent.

However, it has been argued that the inability of public policy to absorb the insights from the innovation research forefront has led to an inappropriate and flawed public policy on innovation (Osborne and Brown, 2011). Others have emphasized how the governance literature on the one hand and the innovation literature on the other hand have not managed to capture the systemic nature of innovation in governance (Moore and Hartley, 2008). Finally, it has been pointed out that the literature on organizational learning has limited influence on the communities of practice working with innovation indicators and measurement (Gault, 2013b). Consequently, there appears to be a need for viewing the various traditions and perspectives in closer connection with each other in order to grasp and capture the many faces of public sector innovation.

Frameworks for measuring public sector innovation

Addressing the uncertainty around the nature of public sector innovation and in order to improve our understanding of these processes, in recent years there have been a number of pilot surveys seeking to develop frameworks to measure innovation in the public sector. Taking as a point of departure the measurement framework developed for the private sector, the pilot surveys in these projects have used a pragmatic approach to measure public sector innovation. In order to create legitimacy and to formalize this type of systematic monitoring, this may have been an appropriate approach. However, there may still be a need for improvements and adjustments to these efforts. Much of the theoretical work on the heterogeneous ecology and the systemic and evolutionary nature of (public sector) innovation is not reflected in the measurement frameworks applied so far. Although innovation measurement frameworks have developed considerably throughout the last 30 years e.g. to better reflect services and a systems approach, "there is more to be done to provide guidance on dealing with framework conditions that have long- and short-term effects [...]" (Gault, 2013a, p. 52).

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“Going back to Lundvall (1992), learning is part of the activity of innovation and it is still not part of the standard practice of innovation measurement and indicator development” (Gault, 2013b p. 448).

The MEPIN project initiated in 2008 was a Nordic research project whose objective was to develop a measurement framework for collecting internationally comparable data on innovation in the public sector (Bloch, 2011; Bloch and Bugge, 2013). Subsequently, a number of other studies have been conducted in recent years, including the EU’s Innobarometer 2010 that was devoted to “Innovation in Public Administration” (Gallup Organization, 2011), NESTA’s Public Sector Innovation Index in the UK (Hughes and Baker, 2011) and the Australian Public Sector Innovation Indicators (APSII) Project (Arundel and Huber, 2013).

The pilot surveys applied modified versions of the four types of innovation categories used to measure innovation in the private sector (OECD and Eurostat, 2005); namely product, process, organizational- and marketing innovation. In both the MEPIN and NESTA surveys, an innovation was defined as:

An innovation is the implementation of a significant change in the way your organization operates or in the products it provides. Innovations comprise new or significant changes to services and goods, operational processes, organizational methods, or the way your organization communicates with users. Innovations must be new to your organization, although they can have been developed by others. They can either be the result of decisions within your organization or in response to new regulations or policy measures.

A key issue and finding from the surveys that have aimed at developing measurement frameworks for innovation in the public sector are extremely high innovation rates in public organizations, which often surpass the innovation rates among European businesses (Arundel and Huber, 2013). This has caused uncertainty whether current measurement frameworks are fully able to capture public sector innovation, and it has generated a debate on what degrees of novelty should be measured. A narrow viewpoint is that only major, novel innovations are important and measurement should thus focus on these. A broader view sees less novel innovation activity, including adoption and moderate improvements, as also being relevant for measurement in order to understand innovation and diffusion in a broader context. Before moving on to the classification exercise we will briefly recapitulate some of the findings from the MEPIN survey as entry points to the analysis.

Overall results from the MEPIN survey

Table 1 presents a selection of results from the MEPIN study concerning innovations, sourcing, cooperation and objectives. Shares of organizations with innovations are very high, both overall for all types and for individual types of innovations. Between 80% and 90% of the respondents in the five Nordic countries stated that they had had at least one type of innovation during the last two years (2008-2009). The shares with product innovations are particularly high (ranging from 38% to 72%) in comparison with innovative shares found in the business sector, which raises some questions concerning whether these results can be compared with those for businesses. Results are more similar

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across countries for product-process innovations (either a product or process innovation), with results ranging from 65% in Finland to 84% in Denmark¹.

There may be a number of potential explanations for the high shares of innovations reported. A first possible factor is that public sector organizations might interpret the concept of innovation differently than businesses, particularly concerning when a change is and is not an innovation. The notion of innovation is relatively new in the context of the public sector, which also may lead to different interpretations of the terminology. Second, the share of large organizations is higher in the public sector than in the business sector which, given that large units are more likely to be innovative, would lead to higher innovative shares. Third, low response rates may introduce an upwards bias in the results if organizations with innovations are more likely to respond to the survey than organizations without innovations. A fourth possible factor is that if the public sector as a whole is under constant change, then public sector organizations may continuously need to adjust to a changing environment or be frequently required to make changes based on new regulations or policies.

Generally only around 20% and 30% of all respondents stated that they were the first to introduce the innovations. The results thus provide an indication that the large majority of innovations reported are based on diffusion and the adoption of innovations from other organizations.

Most product innovations are primarily developed in-house, however also a sizable share stated that they had developed a product innovation in cooperation with a business or another public sector organization. Only around 10% stated that the development of a product innovation was mainly undertaken by other public organizations or businesses.

The results for drivers show that there are multiple drivers of public sector innovation, including internal sources (management and staff), political drivers, other public organizations and businesses. Of these, 'internal drivers' were deemed the most important. The results for strategy and organization indicate that generally under a third of organizations centralize their innovation activities in a separate unit, while around half organize innovation as formal projects.

¹ Given that it is often difficult to separate the actual product from the process (i.e. the provision of the service) for services, the share with product-process innovations may be a more relevant measure than product or process innovations on their own.

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Table 1. Results from the MEPIN survey of innovation in public sector organizations

	Denmark	Finland	Iceland	Norway	Sweden
Innovations					
Any product innovation	71.9	55.0	71.2	56.7	43.9
New to market	38.7	53.8	26.2	34.8	42.6
Mainly own organization	48.8	67.9	38.1	57.4	51.3
Cooperation with business	36.7	49.4	21.4	33.8	42.1
Cooperation with public organizations	30.5	48.1	26.2	38.2	43.4
Mainly other public organizations or businesses	9.4	19.8	9.5	11.8	9.2
Any process innovation	71.9	63.1	54.2	67.1	61.0
Any organizational innovation	66.4	61.7	86.4	62.9	56.8
Any communication innovation	64.1	34.2	86.4	44.6	47.1
Any innovation	87.9	79.2	91.5	83.3	80.9
Drivers					
Any internal driving forces	85.2	N/A	75.9	83.5	93.0
Any political driving forces	59.4	N/A	57.8	55.8	66.4
Public organizations	16.4	N/A	84.4	17.0	27.3
Any business drivers	27.7	N/A	35.6	25.2	32.2
Strategy and organization					
Specific goals for innovation activities	27.3	N/A	65.2	39.1	31.4
Innovation strategy included in overall strategy	31.3	N/A	52.2	26.5	26.6
Development department	26.2	N/A	43.5	12.8	23.7
Innovation activities mainly organised as projects	50.8	N/A	47.8	47.4	37.3

Source: MEPIN pilot study (Bugge et al., 2011). Results provided by Statistics Denmark, Statistics Finland, RANNIS, Statistics Norway and Statistics Sweden.

Note: Results based on a pilot study with the purpose of testing and learning from the collection of innovation data in the public sector. The data should not be considered as official statistics, nor should it be considered suitable for benchmarking. Results based only on responses, and are not grossed up to the full population.

N/A: not available.

Innovations – percentage of all organizations that have implemented each type of innovation.

Innovation strategy – share of all organizations that agree or strongly agree with the listed statement.

Innovation drivers – share of organizations with innovation activities that have listed the driver as highly important. Political drivers are composite of 3 political drivers (budget changes, new laws or regulations, new policy priorities).

Data and method

In order to bring more clarity to the high overall innovation rates a follow-up study to the MEPIN survey was conducted, seeking to generate a better understanding of how the notion of innovation is perceived in the public sector.

The analysis draws on discretionary coding of 1536 examples of innovations collected from both the Nordic MEPIN survey and from the NESTA Public Sector Innovation Index in the UK. As these surveys asked for qualitative examples of actual innovations, this kind of survey offers a useful vehicle to examine how public sector organizations themselves perceive innovation. Moreover, such an analysis

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also allows us to form a critical assessment of how we can improve indicators and frameworks for measurement of public sector innovation.

The classification exercise targeted the following questions: What types of innovations are most prevalent? What is the importance of bricolage for public sector organizations? How systemic is public sector innovation, i.e. to what degree do innovations appear to cut across the boundaries of individual organizations?

The questions asking for examples of innovations across countries for the Nordic and UK surveys were fairly similar, but still have some differences across countries. The standard question for the MEPIN survey was the following: “Please provide a short description of 1-2 examples of innovations introduced during 2008-09.” This basic formulation was used in Denmark, Finland, Iceland and Sweden, though the question was posed as an open, common question for all types of innovations in the Danish and Icelandic questionnaire, while Finland and Sweden asked for examples for each individual type (for Sweden, only for product and process innovations). Norway’s question was also posed as a common question for all types of innovations, but a slightly different formulation was used, where respondents were asked to describe their 1-2 most important innovations instead of examples. It is unclear whether this different formulation has had an impact on responses. Our impression from the analysis is that it has not, which also seems reasonable as one would expect that when most respondents choose an example, they choose one that they feel had some importance to their organization. The question in the NESTA survey for the UK was: “Describe a particularly successful example of a process or service innovation within your organization”. The UK thus also asks for important (or successful) innovation and, as with Sweden is limited to product and process innovations.

The coding in the classification exercise was conducted by two experts examining each example independently of each other and without viewing any other responses to the survey. Thereafter, the two classifications were compared and any differences discussed until a consensus was reached. The classification was made in two rounds: In the first round the examples were classified according to whether they met the definitions of an innovation or not. This first round made it clear how difficult it is to distinguish whether an example meets the criteria required for counting as an innovation or not. The first round of coding also created an awareness that there seemed to be a difference between innovations that were intra-organizational, and others that were inter-organizational and thus more systemic in nature. The second round of coding thus addressed in particular whether the examples could be regarded as ‘bricolage’ or ‘systemic’ innovations. Limited information on each example implied that the coding exercise involved a considerable degree of discretion.

To assess whether the examples were bricolage, we used the following definition by Fuglsang (2010); that the notion of ‘bricolage’ refers to “small, bottom-up and incremental changes often initiated by front line employees in public service production and provision”. The bricolage examples could in many cases be linked with the notion of ‘training’ which were classified in the first round and constitute insignificant innovations (knowledge building without having implemented an innovation) but that are still regarded important small steps in the longer run. An implicit requirement for bricolage was thus

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that these minor changes appeared to be steps towards a larger goal, and not (minor) end goals in themselves. Systemic innovations refer to innovations that involve and affect more actors than the organization that has initiated (and reported) it. Here we have followed Moore and Hartley (2008) who refer to systemic innovations as “...innovations that change production systems that cut across the boundaries of organizations...”.

Results from classification exercise

Table 2 summarizes the results from the classification exercise. Data from the six countries generated a total of 1536 examples. Among the respondents that provided examples, many provided more than one example².

The table shows the distribution of examples across types of innovations³. Around 24 percent of the examples were categorized as product innovations, while the most prevalent type of innovation was process innovations. However, a sizeable share of examples was organizational innovations (between 20 and 34 percent) and a lesser but still significant share was communication innovations. While questions in Sweden and the UK were restricted to product and process innovations, their relative shares of different types of innovations are very similar to those in the other countries. “Multiple type innovation” indicates the share of examples that were viewed to span more than one type of innovation. These shares are quite substantial in all countries and highest in Sweden, where over half of all innovative examples spanned more than one type.

Examples provided by respondents in the Nordic and UK pilot studies span across all four types of innovations. Examples of product innovations are robot vacuum cleaners in nursing homes for elderly, environmentally friendly ambulances, and the use of PARO seal in residential homes (the PARO seal is a robot in the shape of a seal, able to move its eyes and make sounds). Examples of process innovations include a new IT solution for joint login to public services which enables switching between various public services without new logins for each service, and self-service in the personnel and payroll system. Organizational innovations include the ‘Family House’; an interdisciplinary cooperation to provide a single ‘front office’ for users, in this case children and youth in the municipality. Finally, examples of communication innovations are international marketing of educations, a campaign against counterfeit drugs, and SMS notifications to reach citizens with information.

² For example, the 108 examples for Iceland are from 60 respondents, 317 examples from 195 respondents for Norway, 474 examples from 101 respondents for Finland and the 146 examples are based on 107 respondents for Sweden. We do not have comparable numbers for Denmark and the UK.

³ Note that percentages are in terms of all examples and not just examples that were assessed to be innovations.

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Table 2: Types of innovations

Country	Number examples	Product innovation	Process innovation	Organisational innovation	Communication innovation	Multiple type innovation	Not an innovation	Bricolage	Systemic
Denmark	325	23.1%	39.4%	20.3%	10.5%	22.2%	31.4%	33.8%	7.7%
Finland	474	24.5%	45.4%	22.6%	7.2%	22.4%	24.7%	37.6%	10.5%
Iceland	108	26.9%	34.3%	20.4%	13.0%	27.8%	39.8%	31.5%	10.2%
Norway	317	19.2%	43.2%	30.3%	10.7%	30.6%	32.5%	39.1%	8.8%
Sweden	146	28.1%	52.1%	33.6%	7.5%	41.8%	25.3%	15.8%	9.6%
UK	166	25.3%	67.5%	32.5%	3.6%	38.0%	14.5%	18.7%	10.2%
Total	1,536	23.7%	45.9%	25.7%	8.7%	27.9%	27.7%	32.6%	9.4%

Table 2 further illustrates that as much as around 28% of the examples reported were viewed not to meet the criteria for an innovation, i.e. representing a significant change that has been implemented in a given context. At the same time, about a third of all examples were classified as bricolage (19% of all innovative examples), i.e. small, bottom-up and incremental changes.

For Denmark, Finland, Iceland and Norway, shares with bricolage are quite large, ranging from 32% to 39% (note that bricolage can both include proper innovations and examples that were not assessed to be innovations). Hence, for these countries, incremental change appears to play a very large role in public sectors' innovation activities. In contrast, shares are much lower for Sweden (16%) and the UK (19%). It is not clear what lies behind these large differences. If we compare results for Sweden and the UK with the other countries, it can be seen that shares of examples that are innovations or span more than one type of innovation are higher in comparison with other countries. This can have played a role as the bricolage is more prevalent for examples that are not innovations and for non-multiple type innovations. An additional difference that may have played a role is that Sweden and the UK only asked for examples of product and process innovations.

Although the majority of the bricolage examples are not classified as innovations, some of the examples were classified as bricolage while also qualifying as innovations. Among the bricolage examples that were also classified as innovations, the distribution spans all types of innovations.

The table also shows that around 8-10% of all examples and 13% of all innovative examples were classified as systemic innovations. Although less frequent than the notion of bricolage, this share is coherent across all countries and about the same as communication innovations.

Discussion and concluding remarks

In this paper we have sought to improve our understanding of the many faces of public sector innovation. Based on a discretionary classification of 1536 qualitative examples of public sector innovations we have been able to examine the nuances of change spanning from learning and incremental change to radical and systemic innovation. In particular, the paper has sought to generate

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a better understanding of the high innovation rates observed in the pilot surveys towards public sector innovation. The paper has investigated whether the examples reported in surveys targeting innovation in the public sector actually meet the criteria for being an innovation or not, and the extensiveness of bricolage and more systemic innovations among the examples collected and classified.

The fairly large share of non-innovations and the high occurrence of bricolage provide possible explanations to the high innovation rates observed in previous surveys, and suggest that public sector organizations view incremental changes as an important element of their innovation activities. While it can still be considered relevant to distinguish between these and more significant changes, both appear to be vital parts of the public innovation ecology. The fact that some of the examples were classified as both being innovations and bricolage in the two rounds of coding similarly underlines that there are blurred lines between these categories and that distinguishing between them can be difficult.

One can distinguish between organizations that only have undertaken small, incremental changes and those where incremental change is one element of broader and more substantial innovation activities. The results have shown that systemic innovations across multiple actors are somewhat more limited than bricolage, but still significant, corresponding to the share of communication innovations. The share of systemic innovations should therefore not be underestimated as a characteristic of public sector innovation.

Indeed, the systemic characteristic of innovations does not necessarily constitute a separate form of innovation, but may involve rather be applied to all different kinds of innovations (e.g. product, process, organizational and communication innovation). As such it illustrates how innovations often depend upon and involve multiple stakeholders and evolve over time.

In a similar way, and also signaling the systemic nature of innovation processes, an important share of the examples were found to span more than one type of innovation. This includes new services that comprise various types of stakeholders, innovations that involve significant changes in internal work processes, changes in organization or management to accommodate new services and processes, and communication innovations that are part of a larger change in service provision or organization. These 'complex innovations' will thus often require the involvement of a wide range of employees and work functions throughout development and implementation, and to overcome barriers that the complexity presents (Torugsa and Arundel, 2014).

By applying a modified private sector measurement framework to public sector organizations, there is however a danger that the main bulk of innovations targeted and collected by existing measurement frameworks to public sector innovation (product, process, organization and communication innovations) are understood within the boundaries of individual public organizations. In this sense, societal aspects beyond the individual public organization may be neglected. There is a risk in performance measurement systems that increasing reliance on some targets may lead to the neglect of untargeted aspects (Smith et al., 2009).

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In order to avoid such a narrow and atomistic understanding of innovation in the public sector, it seems necessary to also include other faces of public sector innovation in frameworks for measurement, and not least aim to see how they relate to each other. As has been illuminated in this paper, the notions of bricolage and systemic innovations may be seen as expressions of various faces of the ecology of public sector innovations.

Knowing from the literature that innovation should be understood as a systemic phenomenon which involves multiple actors and evolves and unfolds through different phases, it is important for measurement frameworks to take into account various aspects and stages of innovation. In this view, systematic training and incremental change should be perceived as necessary prerequisites to more radical and novel forms of innovation. This paper has pointed at how bricolage and systemic innovations seem to constitute relevant candidates for a broadening of existing measurement frameworks to better capture the learning diverse ecology conditioning of public sector innovation.

References

- Arundel, A. and Hollanders, H. (2011), A taxonomy of innovation: How do public sector agencies operate? Results of the 2010 European Innobarometer survey of public agencies. In *INNO Metrics thematic paper: INNO Metrics*
- Arundel, A. and Huber, D. (2013), From too little to too much innovation? Issues in measuring innovation in the public sector. *Structural Change and Economic Dynamics*, 27, pp. 146-159.
- Bason, C. (2010), *Leading public sector innovation: Co-creating for a better society*. Bristol, UK: The Policy Press.
- Bloch, C. (2011), Measuring Public Innovation in the Nordic Countries - Final Report: MEPIN (Measuring Public Innovation in the Nordic Countries) project. Copenhagen: Danish Agency for Science, Technology and Innovation.
- Bloch, C. and Bugge, M.M. (2013), Public sector innovation - From theory to measurement. *Structural Change and Economic Dynamics*, 27, pp. 133-145.
- Borins, S. (2001), Encouraging innovation in the public sector. *Journal of Intellectual Capital*, 2, 3, pp. 310-319.
- Djellal, F., Gallouj, F. and Miles, I. (2013), Two decades of research on innovation in services: which place for public services? *Structural Change and Economic Dynamics*, 27, pp. 98-117.
- European Commission (2010), Innovation Union Scoreboard 2010 - The Innovation Union's performance scoreboard for Research and Innovation.
- European Commission (2011), Horizon 2020 - The Framework Programme for Research and Innovation Communication from the European Commission.
- European Commission (2013), European Public Sector Innovation Scoreboard (EPSIS) - A pilot exercise: DG Enterprise and Industry.
- Fagerberg, J. (2005), Innovation - A guide to the literature. In *The Oxford Handbook of Innovation*, eds. Fagerberg, J., Mowery, D.C. and Nelson, R.R.. Oxford: Oxford University Press.
- Fuglsang, L. (2010), Bricolage and invisible innovation in public service innovation. *Journal of Innovation Economics*, 1, pp. 67-87.
- Fuglsang, L. and Sørensen, F. (2011), The balance between bricolage and innovation: management dilemmas in sustainable public innovation. *The Service Industries Journal*, 31, pp. 581-595.
- Gallouj, F. and Weinstein, O. (1997), Innovation in services. *Research Policy*, 26, pp. 537-556.

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- Gallup Organization (2011), Analytical Report - Innovation in Public Administration: Report commissioned by the DG Enterprise and Industry of the European Commission.
- Garud, R. and Karnøe, P. (2003), Bricolage versus breakthrough: distributed and embedded agency in technology entrepreneurship. *Research Policy*, 32, pp. 277-300.
- Gault, F. (2013a), The Oslo Manual. In *Handbook of Innovation Indicators and Measurement*, ed. F. Gault, pp. 41-59. Cheltenham, UK: Edward Elgar Publishing Limited.
- Gault, F. (2013b), Innovation indicators and measurement: challenges. In *Handbook of Innovation Indicators and Measurement*, ed. F. Gault, pp. 441-464. Cheltenham, UK: Edward Elgar Publishing Limited.
- Geels, F.W. (2002), Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case-study. *Research Policy*, 31, pp. 1257-1274.
- Geels, F.W. (2014), Regime Resistance against Low-Carbon Transitions: Introducing Politics and Power into the Multi-Level Perspective. *Theory, Culture & Society*, 31, pp. 21-40.
- Head, B.W. and Alford, J. (2015), Wicked Problems: Implications for Public Policy and Management. *Administration & Society*, 47, 6, pp. 711-739.
- Hughes, A. and Baker, C. (2011), Public Sector Innovation Index - The findings from our pilot project measuring innovation in the public sector using a survey approach: Report produced by Ernst & Young for NESTA.
- Kelly, G., Mulgan, G. and Muers, S. (2002), Creating Public Value: An analytical framework for public service reform. Strategy Unit, Cabinet Office, UK.
- Koch, P. and Hauknes, J. (2005), Innovation in the public sector. Report no D20. Publin project under the EU 5th Framework Programme. Oslo: NIFU STEP.
- Kuhlmann, S. and Rip, A. (2014), The challenge of addressing Grand Challenges. A think piece on how innovation can be driven towards the “Grand Challenges” as defined under the European Union Framework Programme Horizon 2020. In *Report to ERIAB*.
- Lundvall, B.A. (1992), *National Systems of Innovation: Towards a theory of innovation and interactive learning*. London: Pinter.
- Mazzucato, M. (2011), The Entrepreneurial State, ed. T.O. University. London, UK: Demos.
- Moore, M. and Hartley, J. (2008), Innovations in governance. *Public Management Review*, 10, pp. 3-20.
- Moore, M.H. (2005), Break-Through Innovations and Continuous Improvement: Two Different Models of Innovative Processes in the Public Sector. *Public Money & Management*, 25, pp. 43-50.
- OECD (2002), The Frascati Manual: The Measurement of Scientific and Technological Activities. Proposed Standard Practice for Surveys on Research and Experimental Development. Paris, France: OECD.
- OECD (2010), The OECD innovation strategy: Getting a head start on tomorrow. Paris, France: Organization for Economic Co-operation and Development.
- OECD (2012), OECD Observatory of Public Sector Innovation.
<http://www.oecd.org/governance/oecdobservatoryofpublicsectorinnovation.htm>.
- OECD and Eurostat (2005), The Oslo Manual - Guidelines for Collecting and Interpreting Innovation Data, 3rd Edition. Paris: OECD.
- Osborne, S.P. and Brown, L. (2011), Innovation, public policy and public services delivery in the UK: The word that would be king? *Public Administration*, 89, pp. 1335-1350.
- Smith, P.C., Mossialos, E., Papanicolas, I. and Leatherman, S. (2009), *Performance Measurement for Health System Improvement - Experiences, Challenges and Prospects*. Cambridge: Cambridge University Press.

Bugge M. and Bloch, C., 2016, Between bricolage and breakthroughs – Framing the many faces of public sector innovation, *Public Money & Management* 36(4):281-288.

POSTPRINT VERSION

Torugsa, N.A. and Arundel, A. (2014), Complexity of Innovation in The Public Sector: A workgroup-level analysis of related factors and outcomes. *Public Management Review* DOI: 10.1080/14719037.2014.984626.

UK Department of Business (2008), Innovation Nation.

Windrum, P. (2008), Innovation and entrepreneurship in public services. In *Innovation in Public Sector Services - Entrepreneurship, Creativity and Management*, ed. Windrum, P. and Koch, P., pp. 3-20. Cheltenham, UK; Northampton, USA: Edward Elgar.