Governmentality and performance for the smart city

Abstract

In answer to an emerging need of systematic research on the relationship between public governance and performance, this paper focuses on the smart city scenario by adopting a critical perspective and an interpretivist approach. The analysis is informed through the Foucauldian "governmentality" framework (Foucault, 2009) and its bio-political implications (Foucault, 2008) to capture the approach adopted by municipalities driving smart city programs in the pursuit of governmentality goals (that is, a balance between moral responsibility and economic rationality).

We contend that smart cities striving for sustainable development engage in programs trying to direct or reorient "regimes of practices" towards desired aims. The presence of networks of organizations in the implementation of such programs may entail the use of performance measurement as a "technology of government" involving both the vertical dimension of performance investigation and – especially – horizontal forms of performance measurement.

By conducting a longitudinal case study with interventionist elements with reference to the City of Helsinki, we have addressed both the benefits and obstacles/problems faced in Helsinki's programs of using performance measurement as a technology of government. We have also revealed the role assumed by the development of performance measurement projects in reorienting regimes of practices s towards specific objectives.

Our findings show that performance measurement operates as a useful, but also problematic technology of government, especially considering fragmentation in inter- and intra-departmental processes and a lack of horizontal accountability. Performance measurement developments in horizontal rationale emerge when reshaping "the conduct of conduct."

Key words: Governmentality; Performance measurement; Smart city; Technology of government.

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1. Introduction

Smart city experiences are rapidly spreading globally as the result of both national or supranational funding actions as well as their innovative way of conceiving cities and citizens' lives. Considering the role assumed at different levels by the smart city's conceptualization and implementation, our analysis considers this particular contemporary scenario of a novel urban policy model that is still at the beginning of its investigation phase, at least in a critical perspective in the accounting literature. Indeed, in the literature we find little systematic research conducted on the relationship between public governance and performance, and "an integrated corpus of empirically based knowledge" (Skelcher, 2008) is still lacking. In response, we intend to address the smart city scenario adopting an interpretivist approach.

The latest smart city implementations have shown a top-down approach, where municipalities are assuming a pivotal role in defining and driving a comprehensive vision about smart city programs (Cocchia, 2014, p. 40). The conceptualization and operationalization of these programs imply a system of information and flow that can be controlled and optimized to improve efficiency of services (Steiner and Veel, 2014). Moving from the consideration that multidimensional performance measurement can be considered as a vehicle for operationalizing the fundamental idea of the smart city – that is, to improve economic and political efficiency as well as the development of the social, cultural, and urban dimensions involved (Caragliu, Del Bo and Nijkamp, 2011) – we explore recent years of Helsinki's experience with social, infrastructural, and emergency services and their performance measurement. The identification of this town comes from its implementation of smart and open city strategies (Forum Virium Helsinki, 2015) and a long history of developing performance measurement.

In particular, we aim to discover the versatile role of performance measurement in governing and developing the city in a smart way to highlight its potentialities and criticalities.

Our analysis is informed through the Foucauldian "governmentality" framework (Foucault, 2009) and its bio-political implications (Foucault, 2008) developed to capture the approach adopted by municipalities in driving smart city programs. At the same time, in these programs the involvement of a plurality of actors creating networks of organizations implies that beside the vertical dimension of performance investigation, horizontal forms of performance measurement are also being developed (Almqvist, Grossi, van Helden and Reichard, 2013; Klijn, 2012). In this view, we aim to show how

this takes place in the city of Helsinki by addressing both the benefits and obstacles/problems faced in the process of using performance measurement as a technology of government and revealing the role assumed by its development in reorienting regimes of practices towards specific objectives (Miller and Rose, 1990).

The empirical part of the research was carried out following a longitudinal case study with interventionist elements. Our findings show that performance measurement operates as a useful, but also problematic technology of government especially considering fragmentation in inter- and intra-departmental processes and a lack of horizontal accountability. Performance measurement developments in horizontal logic emerge when reshaping "the conduct of conduct" in the pursuit of governmentality goals.

The rest of the paper is organized as follows. Section 2 outlines the theoretical framework informing the analysis and section 3 illustrates the research method. In section 4 we offer an overview of the empirical context of the City of Helsinki and present the findings of the empirical research arising from our exploration of the prevailing measurement challenges in the 2007–2013 time span of our investigation and social impacts as a mission to be pursued with performance information, a closing of the information gap and focusing on the horizontal direction in performance improvement. Benchmarking as well as inter- and intra-departmental processes are also investigated in this section. Section 5 discusses the insights, while section 6 concludes the paper and offers suggestions for further research.

2. Theoretical framework

The theoretical framework informing our analysis builds upon the Foucauldian governmentality framework by combining the smart city discourse with the constructs of problematization, technologies of government, regimes of practices, governmental experts, and measurements.

2.1 Governmentality

Governmentality is intended by Foucault as the complex of

> institutions, procedures, analyses and reflections, calculations, and tactics that allow the exercise of this very specific, albeit very complex, power that has the population as its target, political economy as its major form of knowledge, and apparatuses of security as its essential technical instrument (Foucault, 2009, p. 108).

The governmentality notion is linked to the line of force that led towards the affirmation of "government" as a type of power, with the consequent development of a series of apparatuses and knowledge. In particular, various institutional, physical, and administrative mechanisms and knowledge structures constitute the apparatus *(dispositif)* (Foucault, 2009) whose aim is to maintain and enhance the exercise of power in the social body (in our analysis, the city).

Power techniques and form of knowledge are strictly intertwined in a reciprocal constitutive linkage. The Foucauldian concept of governmentality is two-sided as it involves both specific forms of representation and intervention. Governmentality outlines a discursive area in which power is rationalized, enabling a government problem to be addressed (representation) and offering solution strategies (intervention) (Lemke, 2001). Within this governmental rationality, programs aimed at achieving specific objectives have a fundamental role, as they represent schema for the ordering of the social and the economic dimensions of life (Miller and Rose, 1990).

Dealing with the city, our investigation refers to bio-politics (Foucault, 2008): a politics regarding the administration of the condition of life of the population. Indeed, bio-politics is based on the idea of population conceived as a living entity. It is

> the attempt, starting from the eighteenth century, to rationalize problems posed to government practice by phenomena characteristic of the set of living beings forming a population: health, hygiene, birthrate, life expectancy, race (Foucault, 2008, p. 317).

Osborne and Rose (1999) have analysed the city as a "space of government, authority, and 'the conduct of conduct'" showing the means by which the city has been "diagrammed" as a space of power, regulation, ethics, and citizenship, from its ancient Greek domain to contemporary neo-liberal modes of governing the city. Neo-liberal strategies have had a significant impact on the role of the city or municipality throughout the global North and South. The deregulation of capital, financial, and labor markets, accompanied by city policies of entrepreneurialism, resource constraint and marketization, supported by neo-liberalization of urban space and the recreation of local state, have constituted a major emphasis on economy and efficiency in the delivery of public services (Skelcher, Sullivan and Jeffares, 2013, p. 5). In the last two decades much has been written about the entrepreneurial city, identified as the modern model of urban governance accommodating early trends of globalization and neo-liberalization (Kanai, 2014).

In latter-day neo-liberal contexts, governmentality is characterized by the congruence it tries to achieve between a responsible/moral individual and an economic-rational actor (Lemke, 2001). In our critical investigation we are particularly interested in exploring an eventual resistance of "the

real" (Miller and Rose, 1990, p.14), intended as the context of the operationalization of smart city programing, and in understanding the reasons of consequent failures in reaching the desired aims. Indeed, if the political programing identifies objectives and coherent devices to reach them, the operationalization of the program implies a complex process

> formulating the categories and techniques to make it realizable; assembling and sometimes devising technologies to give effect to its objectives in the lives of individuals, enterprises and organizations; and evaluating, debating and contesting the consequences of such programmes and conditions of their failure and success (Miller and Rose, 1990).

2.2 Smart city discourse

The Foucauldian literature has underlined that cities can use various means (e.g. programs) to exercise their government power (Miller and Rose, 1990, p. 8). The comprehension of both the role of technical means adopted and their goals in the modes of government requires an analysis of their "political rationalities" (Rose and Miller, 1992, p. 175). This aspect implies the identification of a "wider discursive field" (Miller and Rose, 1990, p. 5) in which the government is located. In this regard, our investigation can be embedded in the smart city discourse. In the evolution of urban imaginaries, the smart city discourse represents the new frontier linked to the wake of narratives of the green/sustainable city and of the informational/intelligent city (Vanolo, 2014). In the previous literature on smart cities, there are three different types of ideal definitions: smart cities as cities using smart technologies (technological focus), smart cities as cities with smart people (human resource focus), and smart cities as cities with smart collaboration (governance focus) (Meijer and Bolivar, 2015).

The desire to create an ideal town is as old as the history of human location in an urban context, which gave the impetus for a search for a mediation between urban reality and ideality, where the former is characterized by complexity and potential disorder and the latter marked by order, cleanness, absence of vice, etc. (Steiner and Veel, 2014).

Within the contemporary smart city discourse, the city is conceived as a system of information and flows that can be controlled, modified, and optimized to reach efficiency goals in many areas (transportation, energy, healthcare, etc.). Definition of a smart city is offered by Caragliu et al. (2011, p. 70):

> We believe a city to be smart when investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic growth

> and a high quality of life, with a wise management of natural resources, through participatory governance.

Caragliu et al. (2011) also identified the aspects proper to a smart city: the utilization of network infrastructure to improve economic and political efficiency and enable social, cultural, and urban development; an underlying emphasis on business-led urban development; a strong focus on the aim of achieving social inclusion of various urban residents in public services; a stress on the crucial role of high-tech and creative industries in long-run urban growth; profound attention to the role of social and relational capital; and finally, social and environmental sustainability as a major component of smart cities.

The term smart city clearly refers to the relation between the city government and its citizens (i.e. good governance or smart governance) (Lombardi, 2011). A smart city seems able to provide infrastructures and services that improve the citizens' life (Cretu, 2012). There is a growing literature on smart city that refers to "*sustainable* and liveable city" (Cretu, 2012), as a complex organization and considers its growth to be measurable in terms of social, economic, and environmental performance. Yet, the development (i.e. growth) of a city may create tensions with its sustainability. According to Hardoy, Mitlin and Satterthwaite (1992), there are contradictions between sustainability and development, as worldwide most of the cities which can be judged positively by development criteria (i.e. social, economic and political goals) have among the highest draws on environmental capital (i.e. use of non-renewable resources, stratospheric ozone-depleting gases, etc.).

This discussion suggests that taking sustainable development of public services seriously implies understanding the challenges and complexities of emerging governance of public service provision. More knowledge is needed of what outcomes existing public governance models generate in terms of sustainability. Public sector reforms have mainly been designed and implemented with the purpose of improving effectiveness and efficiency, but with sustainability as a core element of public sector development, performance necessarily needs to indicate also social and environmental as well as financial results (Elkington, 1998). This shows the importance for public-serving organizations to constantly seek a trade-off between financial and non-financial performance measures (Peda, Argento and Grossi, 2013).

In addition, some authors argue that it is not enough to focus on the sustainability of individual public service organizations. Rather, the focus must integrate both an outward-facing concern with public service effectiveness and an inward-facing balance of individual organizational sustainability against overall public service sustainability (Osborne, Radnor, Vidal and Kinder, 2014). This is the challenge for smart cities seeking to achieve their governmentality goals.

2.3 Problematization in the smart city discourse

An understanding of the government of smart cities requires an investigation of its problematization. Rose and Miller (1992, p. 181) have underlined that government is a problematizing activity; indeed it poses the obligations of rulers in relation to the problems they try to address. The identification and examination of specific situations calling into question the governing activity, i.e. the "problematization" sphere (Dean, 2010, p. 38), is fundamental to understanding the context where government, in its conduct of conduct, emerges. As expressed by Dean:

> Problematizations are made on the basis of particular 'regimes of practices' of government, with particular techniques, language, grids of analysis and evaluation, forms of knowledge and expertise (2010, p. 38).

In a governmentality perspective, governing requires more than ruling. Indeed, it involves skills and practical knowledge, relatively systematized and organized ways of doing things. These requirements are named "regimes of practices" and are represented by organized practices through which we are governed and through which we govern ourselves (Dean, 2010, p. 28).

This discourse involves specialists of a different kind, that is, governmental experts (Rose and Miller, 1992) and accordingly, considering the discourse we are dealing with, a plurality of actors concretely building the city through their decisions, projects, and actions (Söderström, Paasche and Klauser, 2014).

In our analysis, technologies of government are intended as those mechanisms "[...] through which authorities of various sorts have sought to shape, normalize and instrumentalize the conduct, thought, decisions and aspirations of others in order to achieve the objectives they consider desirable" (Miller and Rose, 1990, p. 8). The technologies are used to direct conduct. Indeed, it is through technologies like techniques of notation, computation and calculation, procedures of examination and assessment, surveys, tables, etc. that authorities seek to instantiate government (Rose and Miller, 1992, p. 183).

Technologies of government express the fundamental link between the study of forms of knowledge and regimes of practices of different kinds (e.g. curing, assisting, schooling, etc.) (Dean, 1996, p. 52). In terms of technologies of government, different measurement approaches can be considered to investigate how these technologies operate to reach governmentality goals – both political and managerial (Kloot and Martin, 2000) by reorienting regimes of practices towards desired aims.

Within the smart city discourse, a network of different actors emerges and requires performance measurement systems through which authorities can shape, normalize, and instrumentalize the conduct, thought, decisions, and aspirations of others in order to achieve the objectives they consider desirable (Miller and Rose, 1990, p. 8). Networks are initiatives deliberately undertaken by government to accomplish public goals, with measurable performance goals, responsibilities assigned to each partner, and a structured information flow (Goldsmith and Eggers, 2004, p. 8). Networks move information and decision making along the horizontal plane inside and outside traditional boundaries (Roberts, 2004, p. 27). According to Michels and Meijer (2008), a horizontal government mode means more coordinance than subordinance, more negotiation than command, more symmetrical communication and abundant autonomy.

Performance measurement can be regarded as an important communication tool in organizations (Hall, 2010) but its role is inherently dynamic and complex as it is both shaped by and is actively shaping the practices within organizations (Ahrens and Chapman, 2007). The significance of quantitative performance measurement information typically increases when organizational size increases (Garengo and Bititci, 2007) which is often the case in smart cities. The most common starting point for using performance measurement is to address vertical direction. Many studies have concentrated on the implementation of strategy through performance measurement (Grafton, Lillis and Widener, 2010; Kaplan and Norton, 1992) reflecting top-down direction in communication. Also bottom-up direction that highlights information gathering from the operative level has gained increasing interest in recent years (Jääskeläinen, 2013). Many of the previous studies on performance measurement concentrate on the vertical aspects with the emphasis on existing organizational structures and hierarchies (Adcroft and Willis, 2005; Bititci, Garengo, Dörfler and Nudurupati, 2012). However, the horizontal perspective on performance measurement has so far gained considerably less attention (Johnsen, 2005), although cross-functional networks are a common delivery mechanism for public services (Provan and Milward, 2001) and there is an increasing interest in collaborative public management (McGuire, 2006). In addition to processes crossing organizational boundaries, horizontal performance measurement relates to inter- and intra-organizational benchmarking supporting learning and quality improvement by increasing the information exchange among organizational units (Goddard and Mannion, 2004). A horizontal approach to performance measurement requires a new kind of framework that contains a set of strategies for addressing the areas that are crucial to accountability: setting goals, aligning values, establishing trust, structuring incentives, measuring performance, sharing risk, and managing change (Goldsmith and Eggers, 2004, p. 124).

To sum up, performance measurement frameworks supporting smart cities in achieving their goals are paramount. Smart cities rely on a network of organizations which should perform in line with coordinated goals. This means that besides vertical performance (of single organizations), horizontal performance (of networks of organizations) also needs to be measured, analyzed, and evaluated (Almqvist et al., 2013; Klijn, 2012) since it is the network performance that enables the smart city to fulfil its governmentality goals such as societal impacts. Performance information within networks is meant to support the debate and dialogue among inter-dependent partners (Almqvist et al., 2013). It follows that reporting the results achieved by each organization and the network as a whole is a key aspect for governing smart cities. Measuring network performance for monitoring/controlling purposes is complex because a number of criticalities may exist. First, the performance measures/indicators may not be attuned to one another, making comparisons useless and debate/dialogue difficult. Second, inter-organizational processes (i.e. cooperation between network organizations) may need to be included in the performance evaluation system, requiring changes in accountability (Michels and Meijer, 2008). Finally, financial constraints may hinder the possibility of measuring network performance.

Combining the constructs of our theoretical framework, it may be suggested that smart cities pursuing governmentality goals (i.e. balance between moral responsibility and economic rationality) in the drive for sustainable development, engage in programs that try to direct or reorient regimes of practices towards desired aims. Implementing such programs may entail the use of performance measurement as a technology of government involving vertical and – especially – horizontal flows of information within smart cities' networks, including a plurality of actors. However, the shaping and use of this technology of government, while potentially beneficial, may raise criticalities that require the smart cities to deal with the problematization stemming from regimes of practices not moving in the desired direction.

3. Methodology

The object of our case analysis is the City of Helsinki, Finland. It was chosen because of its deep involvement in processes implementing smart and open city strategies with a plurality of actors (Forum Virium Helsinki, 2015) and a long history of developing performance measurement.

As emphasized by Jarmo Eskelinen, CEO of Forum Virium Helsinki, an innovation unit within the City of Helsinki organization whose main goal is to develop the essential building blocks for smart

and open cities of the future, smart city significance goes beyond IT solutions and advanced infrastructure:

> For Helsinki, Smart City means more than advanced infrastructure and state-of-the-art technological solutions. For Helsinki, Smart City signifies also advancing open engagement of the citizens and the rest of the city community, pioneering in open data and transparency of city governance, as well as promoting agile service development.

Helsinki's long history of performance measurement enabled an investigation on both the vertical and horizontal dimensions (Almqvist et al., 2013; Klijn, 2012) of performance measurement.

The empirical part of the research was carried out following a longitudinal case study with interventionist elements. Interventionist research is understood as an approach in which the researcher's participation and active involvement in the empirical context is deliberately used as a research asset (Suomala, Lyly-Yrjänäinen and Lukka, 2014); ideally, it produces both theoretically and pragmatically relevant results (Lukka and Suomala, 2014). In general, interventions can be different kinds of theoretically informed deeds or acts carried out by the researcher that seek to contribute to resolving practical managerial or technological challenges faced within the empirical context (Jönsson and Lukka, 2007; Suomala and Lyly-Yrjänäinen, 2012). In the case of this study, one of the authors acted as an external expert in multi-professional teams developing performance measurement on several projects. The role of the author was a "governmental expert" and a catalyst stimulating a critical debate among the various actors who developed and adopted the performance measurement. Seen in this vein and considering the object of our investigation, interventions not only helped to build and motivate access to the Helsinki context, but also constituted a vehicle to unveil and reflect phenomena in the smart city discourse (Vanolo, 2014). These phenomena would be difficult to identify without the in-depth access characterized by high trust between the researcher and the various actors (e.g. public managers of the inter-departmental/network processes) in the empirical context. In this approach, the researcher thus is able to reach an insider, emic, status (Pike, 1954).

To achieve the aims of our paper, the field researcher was an active member of eight teams developing performance measures for the City of Helsinki over the 2007–2013 period. The researcher's interventions included wide and versatile participation in the process aiming at establishing new kinds of performance measures supporting horizontal accountability, goal setting, and coordination and communication within the organization. Specifically, the researcher participated in and facilitated workshops, idea meetings and seminars as well as provided the organization with expert judgement,

basing suggestions on specific metrics, calculations, principles, and measurement structures. In addition, leveraging the access gained through interventionist work the researcher carried out a semi-structured interview study in 2007 addressed to 18 senior managers from all the major departments and central administration to better understand the status, history, and development needs for performance measurement within the problematizing activity (Rose and Miller 1992, p. 181) and related forms of knowledge and expertise (Dean 2010, p. 38) that were the basis for the intervention. The interview respondents represented 10 different city departments including infrastructural services, educational services, social and health care services, and sports and cultural services. Each interview lasted about one hour and included 16 questions divided into three main themes: productivity phenomenon and its drivers, current status of productivity measurement, and criteria and desired purposes for productivity measurement. Since many of the questions in the interviews examined detailed technical issues of performance measures, only a few key elements are described in this paper to illustrate aspects relevant to the research objectives at hand. Table 1 summarizes the most important empirical research methods of this study.

Table 1 Empirical research methods at the City of Helsinki

Research phase and method	**Topic**	**Interviewees/participants**
Interview study in 2007	• Productivity and drivers affecting to productivity • Status of productivity measurement • Criteria and desired purposes of productivity measurement	18 senior managers representing all the key departments of the city of Helsinki
Around 40 interventionist workshops during 2007-2010 in six different social services	• Taking service-specific characteristics into account in operative performance measurement • Facilitating the use of performance measurement in benchmarking	Six performance measurement development teams participated by one of the authors and 4-5 persons (service-specific managers, analysts and accounting experts)
A group interview and six interventionist workshops in joint infrastructure construction process during 2011-2013	• Inter-departmental processes and their characteristics • Performance information requirements in inter-departmental processes • Challenges and potential solutions to measuring performance of inter-departmental processes	One performance measurement development team consisting of 5-10 persons including one of the authors and another researcher, experts (e.g. engineers), managers and directors from the participating departments

A group interviews and six interventionist workshops in the fire brigade during 2011-2013	• Intra-departmental processes and their characteristics • Challenges and potential solutions in measuring the prevention of undesired events and synergies between activities	One performance measurement development team consisting of 6 persons including one of the authors and another researcher, three managers and one expert from the fire brigade

This in-depth access created through the interventionist process provided an opportunity for the field researcher to closely observe the possibilities and challenges that relate to using performance measurement as a technology of government in the Helsinki smart city discourse (Vanolo, 2014). More specifically, in this paper our analysis focuses on the problematization (Dean, 2010, p. 38) raised within social, infrastructural, and emergency services and related governing activity.

4. Empirical context and findings

The empirical context of this study is the City of Helsinki (Finland) which has about 40,000 employees and an annual expenditure of about €4,500 million. Social services and health care account for more than half of the total expenditure. Most of the income is derived from tax revenues. There are about 29 departments in the City of Helsinki administration, including the Public Works Department, Education Department, and Department of Social Services and Health Care. In addition, the City administration comprises six public utilities including City Transport and Helsinki Energy. The City Council is the supreme decision-making body of the organization and delegates power to the city government, various committees, and individual officials (see Figure 1).

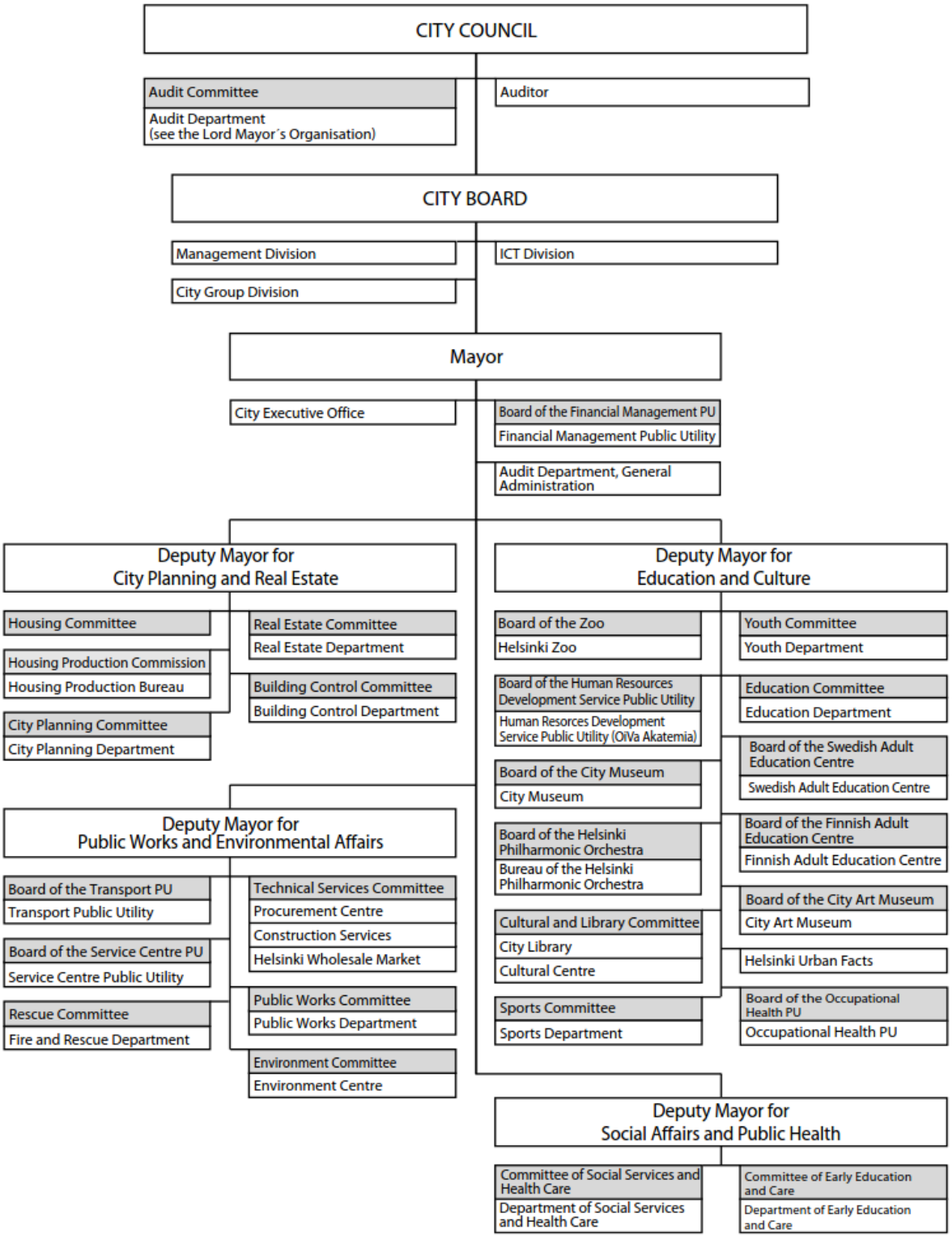

Figure 1 Organizational chart of the City of Helsinki

The organization offers a great number of different services such as infrastructural services, city transportation (local trains, subway and busses), basic education, primary health care, and social services. It can be described as a pluralistic multi-branch organization in terms of variety of services provided, with few equivalents in the private sector. A key role of municipalities in Finland is to

organize legally obligated services to the citizens. In the case of Helsinki, the majority of services are also provided by the city. However, more and more services are purchased from private and non-profit operators. Common denominators of the operations in the organization relate to the provision of services rather than products. There is also a limited market mechanism and lack of market prices for many of the individual services.

The City of Helsinki has a long history of implementing performance measurement, and more specifically, productivity measurement. Productivity measurement was first initiated in the 1980s. Centrally-driven measurement efforts took the form of non-recurring studies and reports. In the 1990s, productivity measurement was implemented more systematically in different departments with a centrally-driven accounting instruction.

4.1 Overview of identified performance measurement challenges in 2007

In 2007, the prevailing centrally-driven instruction for performance measurement in city departments still originated from the beginning of 1990s. It addressed the monitoring of productivity trends in the departments. Each department had measures following the instructions which were reported upwards to the central administration. This approach to measurement highlighting reporting did not satisfy the managerial information needs in departments (Jääskeläinen and Laihonen, 2014). The provided instructions led to standard measures which did not take the aspects specific to different public services into account. Especially the measures related to outputs were deemed as irrelevant from the managerial point of view.

The reasons for the failure of earlier attempts to measure productivity were studied in an interview study addressed to 18 senior managers of the City of Helsinki in 2007. The most common response to a question regarding the status of productivity was that there was no knowledge of productivity level, since the measures used were deficient. Almost half of the respondents felt that there was no use for the current deficient measures, which were regarded more as an extra burden. As one of the senior managers representing social services described it:

> I follow the overall departmental productivity trend but do not regard it useful, since it does not provide information on the factors affecting changes in the trend.

All respondents identified something to be criticized in the measurement. The most common objects of criticism were the output measures used. In many services, operations and service content varied considerably depending on customers and other circumstantial factors. The output measure was too standard and did not capture the varying nature of service content. Another group of respondents

criticized the lack of detail in measurement. Results describing the top levels of departments did not provide information that could be linked to intra- and inter-departmental operations.

Based on the interview results, one key recommendation for further development work was to improve operative performance measurement. This could also improve the output measures since contextual features could be better taken into account.

In addition to improving contextual fit of performance measurement, requirement of understanding better the horizontal and vertical interconnections between operations was raised through the discussion on the gap between performance information and societal impact. Some senior managers addressed their criticism towards output measures by highlighting outcomes or service impacts instead of outputs. This criticism can be linked to the eventual mission of city organizations which is to provide societal impacts such as sustainability of the region. In a smart city context, despite the fact that the performance of individual organizational entities or actors is not negligible, the government is more interested in the eventual result of the whole service system, its ability to provide customer benefits and to create welfare for the residents of the region.

The concepts and phenomena related to societal impacts seemed to require much more clarity and analysis. An essential challenge is defining and measuring the result of the work. It appeared that the examination of service impacts is somewhat easier when larger entities are considered. According to a senior manager representing social services:

> It is necessary to look at the outcomes when examining a large department as a whole whereas in smaller units it is often wiser to assess the quantitative outputs closer to actual operations since the effects of one's own actions can be identified and linked to the outputs.

It is notable that societal impacts are often provided by several services and organizational entities whose particular role is difficult to differentiate. There are also many variables that are more difficult to control directly by the efforts of municipalities, most notably the actions of customers; and societal and legislative changes For example, it cannot be guaranteed that patients follow their doctor's instructions and the recovery processes are therefore partly impacted by the decisions of a patient.

4.2 Horizontal direction in performance improvement

In 2007 an update to performance measurement practices was initiated by the financial planning division of central administration of the City of Helsinki. This division supports city directors in decision-making related to economic issues by preparing instructions, plans and recommendations

and by consulting in issues related to economy and management control. The goal of this development initiative was to overcome the earlier difficulties in measurement. One of the driving forces was improvement in information technology which enabled greater detail in measurement. At this time, measurement efforts reached the operative level and internal service-providing units (e.g. individual child daycare centers), especially in social services. Productivity examination was widened to also include aspects of service quality and personnel welfare, which related to the aims of sustainability and societal impacts.

In the interventionist study aiming at improving performance measurement practices of the City of Helsinki from 2007 to 2010, the field researcher observed benchmarking of performance results as a potential way to facilitate healthy competition in an environment with limited market mechanism. It was the operative focus in measurement development piloted in social services that led to the identification of benchmarking as a potential tool for performance improvement. The high number of similar operative units appeared to be a fruitful context for performance benchmarking. The potential of benchmarking was observed when testing a productivity measurement instrument including both direct (output/costs) and indirect (utilization rates of key resources) productivity measures, complemented by information on service quality and personnel welfare. When the measurement results of comparable units were first openly presented in a seminar, the participants (unit managers) immediately started comparison and discussion of the results. Discussion on the causes of the results and the differences between the units seemed to facilitate learning and motivation towards performance improvement. According to several senior participants (accounting experts), this was an exceptional development since productivity was traditionally regarded as something negative (controlling the costs). The same observation was made on several occasions where measurement results were presented.

The need for performance-related benchmarking was widely acknowledged in the interviews with top management in 2007. Internal benchmarking of services provided by the City of Helsinki was among one of the most mentioned when desired purposes of performance measurement were discussed. Internal benchmarking can be carried out by comparing different city regions, organizational units, and services. Another interesting object of benchmarking mentioned by several interviewees related to the comparison of their own service production with privately purchased services from organizations in the same sector.

The comparison and benchmarking of performance results is also a cultural issue and relates to transparency in organizations. During an informal discussion after one interview with a senior officer in the central administration, an issue related to the culture of comparisons was raised. According to

the senior officer comparisons between departments or units were quite rare in the City of Helsinki in the 1990s. In practice, the public presentation of productivity change indices from different departments was a daring move. At the time of the informal discussion (2010), the interviewee considered that the organization was ready for further comparisons. However, while several measurement system development projects were at work between 2007 and 2013, it was perceivable that the culture regarding comparisons of performance results varied considerably across the organization. Results were not always allowed to be publicly investigated. Thus, the transparency of operations likewise varied a lot across the organization.

Strategic programs are one type of formal controls in the City of Helsinki. These programs are accepted by the city council; and prepared and monitored by the city board. Helsinki's strategic program for 2009–2012 called for better tools, such as binding common targets, rewarding and a process management model, to avoid sub-optimization of functions and units. The mission was to nurture productivity and effectiveness at the level of the entire Helsinki region – not merely individual departments. As described above, the prevailing hierarchical examination of measures and performance did not always reveal the causes of societal impacts. Hence, it was even more important to perform a horizontal examination of processes and networks which could reveal the causalities between different services.

Senior managers repeatedly mentioned performance of inter-departmental processes in the interview study (2007). Interviewees stated that it was essential to better understand the causalities and interconnections between the services provided by different organizational entities. Successful work carried out by a certain department might affect the demand for services in other departments. As a senior manager representing health services explained:

> An essential performance driver in our city is the functional process between different departments and services. The city should evaluate the impacts of each department's public health operations in the Helsinki region. As an example, I would highlight the important role of sports services and facilities in decreasing sicknesses of citizens.

Many similar examples of causalities between services were identified, especially in the area of health care and social services. Reducing the demand for expensive corrective health services would be desirable, regardless of the considerable increase in the costs of certain preventive social services. The connections between different organizational entities were also described as necessary to understand in order to avoid sub-optimization in an organizational structure relying on vertical hierarchies. Accountability or control structures did not typically overlap the existing hierarchical

organizational boundaries. At the level of individuals, there were no incentives for actively seeking inter-organizational collaboration since there were no control structures for it.

The performance of inter-departmental and intra-departmental processes was thus included as one key aspect of the strategic program of the city for the period 2009–2012. The strategic program highlighted the purposes:

> High-quality management and personnel competence development is utilized to facilitate the obtaining of common targets. Governance of cross-functional service processes is implemented to increase customer benefits and efficiency of resource usage. Cross-functional processes crossing both internal and external organizational boundaries are developed. A new process management model is designed and necessary operative and reward targets are defined. (Strategy Program, 2009).

The aim was to improve quality, effectiveness, and productivity by paying attention to cooperation between departments and the management and control of inter-departmental processes. A key driver for including inter-departmental processes in the strategy was the observation made by a senior city manager on his way to work. The same part of a street was opened over and over again by different operators of the City of Helsinki and their private subcontractors. In addition, citizens were continually complaining about construction work on the same parts of the street.

When the situation was investigated in more detail, it was found that the most obvious examples were caused by lack of proper work planning between the operators. A resistance of the ‘real’ (Miller and Rose, 1990, p.14), intended as the operationalization context of Strategy Program, seems to be at work, with a consequent failure in reaching the desired aims.

The most extreme example went as follows: The first operator carried out its own task. It dug the street, implemented the required tasks (e.g. built necessary pipelines), refilled the pit, and finished rebuilding the street. A short while later, a second operator came to the same part of the street and did its own task, destroying the street again. In the worst case, the results of the first operator (e.g. new pipelines) hindered the work of the second. This, in turn, resulted in a considerable amount of extra work for the second operator. It also meant lengthy inconvenience to the public using the street. Furthermore, poor coordination between operators had led to suboptimal utilization of street space in large infrastructural construction sites. There were often multiple service and storage spaces, and temporary working offices in the limited street areas. In some cases, this had also led to problems in occupational safety.

The current way of operating was sometimes motivated by the short-term financial benefits of single operators. More coordinated work required more time for planning and flexibility in terms of construction schedules. Operative performance measurement of individual operators possibly led to optimizing the performance of a certain department or departmental section at the expense of another. Financial savings were obvious at the level of the whole city but not always in the case of single operators. Therefore, the new way of organizing the work required an official solution, a new kind of performance measurement and cultural change.

The City Board had already passed a resolution in 2006 (34§/2006) to accelerate the infrastructural digging work of its own departments in the public street areas. The resolution highlighted that:

> All departments and public utilities implementing infrastructural digging in public areas must follow the instructions of Public Works Department regarding working times and decrease the inconvenience to the public. In addition, Public Works Department must report quarterly on the plans and progress of infrastructural digging work until the end of 2007.

This resolution led to an official agreement (27.3.2008) between all the main infrastructural operations participating in large-scale construction projects, namely the Energy Department, Public Works Department, City Planning Department, City Transport, and Water Department. A joint infrastructure construction site was defined as a site "where purchasers and providers and their subcontractors operate either simultaneously or consecutively." The agreement had the following objectives: a) less inconvenience to the public (effort to improve social acceptance of urban construction), b) improved overall quality (e.g. better safety at the construction site, less reworking), c) cost-efficiency (e.g. shorter construction time, fewer interruptions during construction).

A new kind of performance measurement system was defined during a development project (2011–2013) in order to demonstrate the results of the joint operating model. The system was intended to break loose from the traditional hierarchical organizational structures and aimed to capture the performance of inter-organizational operations. The performance measurement system had two main perspectives: the whole construction process (strategic focus) and the phases (programming, design, construction) of the process independently (operative focus). It included the following joint measures for departments participating to the joint operating models: success rate of programming (i.e. initiation of all the possible joint projects), meeting of cost and schedule targets, costs of added repair and adjustment work and evaluation index on the inconvenience for the public.

The implementation of the new measurement was perceived as challenging for two main reasons. Information systems differed considerably between different operators. Even information on costs and schedules was calculated differently, and new definition work was needed in order to obtain comparable results. Also the practices of documenting data into systems varied between the departments. The new examination also required a new kind of reporting tool partly aggregating and combining information provided by the departments. The prevailing managerial culture of the city was built upon the traditional organizational boundaries and hierarchies. During the measurement development workshops it was observable that the new kind of networked culture was still under development. Many aspects (other than measurement) of the new way of operating were often taken into discussion. To the external observer it appeared that the shift from organization-specific culture to a more open and networked way of analyzing performance needs some party to have clear legitimacy to act as a leader of the network in the sense of gathering, merging, refining, and sharing of performance results even though one of the departments was already formally assigned as the leading party in each project.

Also, intra-departmental processes can be a fruitful context for horizontal direction in performance improvement. Among the interventionist case studies on developing productivity measurement in 2011–2013, was the fire brigade of the City of Helsinki. A fire brigade can be a classic example of managerial challenges caused by difficulties in capacity planning. Defining the right capacity levels for optimal productivity and effectiveness is a very a complicated and even political question. In addition, definition of service outputs is difficult. Before the measurement development work, outputs of the fire brigade were measured by the number of rescue assignments and fire inspections, and the area in square meters of investigated buildings. Many challenges in measurement had been identified. The most obvious was that the mission of a fire brigade cannot be to increase rescue assignments. Rather, the societal mission should be to prevent accidents and to provide readiness. Furthermore, the current measurement practices did not account for the synergy benefits of using the same resources on different tasks. In the City of Helsinki, the same personnel worked in three different functions: fire inspections, emergency care, and rescue operations. This enabled clear synergy benefits when a large allocation of resources were required in any case as a buffer to ensure readiness in different circumstances.

The mission to prevent material and human harm directed the development of a new measurement system. Different functions were examined in parallel. Their interconnections were identified and their measures were combined in a single multidimensional measurement system. A separate measure was devised for the synergy benefits between emergency care and rescue operations. Outputs of all necessary tasks, as well as supportive ones such as maintenance were taken into examination, since

it was deemed important to reveal the beneficial work carried out between rescue operations. The work aimed at preventing rescue operations was given much more attention since it would eventually lead to cost savings. The preventive work was measured by the number of fire inspections and instructions given to the public and the change in evaluated safety levels in different building types.

5. Discussion

Exploring the relationship between public governance and performance, we have attempted in this paper to examine the smart city scenario by adopting a critical perspective and an interpretivist approach. In the light of the governmentality framework (Foucault, 2008, 2009) we have analysed how municipalities drive smart city programs in the pursuit of governmentality goals, considering the case of Helsinki.

The City of Helsinki – in the attempt to smartly strive for sustainable and rational development – has engaged in trying to reorient regimes of practices towards desired aims (i.e. ensure societal impacts in a sustainable and effective way). This is in line with the argument that modern cities address a major emphasis on economy and efficiency in public services delivery (see Skelcher et al., 2013) while seeking for sustainability and positive impacts on citizens (Vanolo, 2014; Lombardi, 2011; Cretu, 2012). The official resolution (2006), agreement (2008) and strategic program (2009), as well as various performance measurement development projects, are examples of the governing activity, as intended by Rose and Miller (1992), performed by the City of Helsinki over time. Moreover, the findings show how this activity becomes an ongoing process when the chosen technologies of government are unable to direct conduct in the right direction. In our analysis, we have shown how the productivity measures initially implemented failed to achieve the overall goals, meaning that performance measurement needed adjustments.

The empirical investigation highlighted that one aspect important to achieve smart city goals (i.e. quality, effectiveness, and productivity) was the need for changing performance measurement in order to capture the interconnections between the services provided by various operators included in the City of Helsinki network. Performance measurement has been used as a ”technology of government,”, as defined by Miller and Rose (1990), involving both vertical and – especially – horizontal dimensions of performance investigation. The traditional performance measures have not addressed the horizontal dimension highlighting collaboration between organizational units (Mandell and Keast, 2007). In the case of Helsinki, performance measurement was seen as a tool to demonstrate the benefits of working in a joint model overlapping traditional organizational hierarchies. This was a way to justify modifications to the prevailing way of operating. Performance measurement was also seen as a facilitator of transparency and communication between organizational entities. Reorienting

regimes of practices towards improved quality, effectiveness, and productivity, by favoring cooperation between departments and introducing inter-departmental control processes, was pursued via the development of performance measurement projects.

While the various “programs” were clearly aimed at directing regimes of practices towards desired objectives, observations revealed the complexity of implementing the strategic program through various performance development projects. That is, changing performance measurement of the different organizational entities of the City of Helsinki has proven to be complex because of the interconnections existing between the services provided and the difficulties in transitioning to the new performance measurement system, given that the establishment of a networked culture requires time and acceptance.

In infrastructure construction sites there are many operators representing the city organization and having varying ways of operating and cultural differences. Furthermore, the use of private contractors increases the number of actors considerably. The case of emergency services demonstrated that even cooperation within the same department can involve complex interconnections between services. It is notable that performance measurement development workshops aiming at inter-departmental examination commonly initiated discussion on many topical themes and issues between departments other than performance measurement itself. Therefore, it appeared that the projects more widely facilitated the implementation of new regimes of practices. However, other ways of implementing strategic programs and resolutions could have been applied.

Our findings show that using performance measurement as a technology of government can provide benefits, but is also problematic. Findings reveal that performance measurement developments in horizontal logic have emerged when reshaping “the conduct of conduct.” The need to ensure a sustainable and liveable city (using the words of Cretu, 2012) prompted the City of Helsinki to prevent further overlaps and wastes, as shown in the example of the different operators working on the same street, and to develop cross-functional process management models.

This means that the City of Helsinki has become more aware of its cross-functional networks for the delivery of public services (Provan and Milward, 2001) and paid attention to the horizontal perspective of performance measurement (Johnsen, 2005). In that sense, the City of Helsinki had to deal with inter-organizational cooperation and benchmarking, supporting learning and quality improvement by increasing the information exchange between organizational units (Goddard and Mannion, 2004) and identifying a comprehensive framework for measuring and evaluating network performance (Goldsmith and Eggers, 2004; Almqvist et al., 2013; Klijn, 2012).

Challenges in using performance measurement as a technology of government relate to fragmentation in the inter- and intra-departmental processes, the difficulties of capturing synergies, a lack of horizontal accountability, and limited transparency. One observation regarding the use of performance measurement in smart cities was that this tool sometimes appears as something that needs to be done without wide understanding of the reasons for change. As an example, almost half of the respondents representing senior managers felt that they had no use for their deficient productivity measures. Lacking a link to operations and poor output measures were blamed. Some of the respondents criticized that societal outcomes were not captured with prevailing measurement practices. There are certain mandatory measures (especially output measures), which are required essentially for reporting purposes. Top management and politicians regard such measures valuable as such, even though it is the managerial relevance and validity of measures that should matter. This was possibly one reason for comments considering performance measurement as an extra burden. Deficient measures may also hinder the achievement of the eventual mission and facilitate undesirable behavior.

In our analysis, in finding an accommodation between the phenomena of population and bio-sociological processes (Dean, 2010, p. 119), forms of coordination and centralization (Foucault, 1997, p. 222-3) with horizontal accountability perspective emerge (Michels and Meijer, 2008). In this regard, performance measurement is a concrete tool potentially increasing transparency in large city organizations (Verbeeten, 2008). In the empirical examination, the issue of limited transparency was discussed especially regarding the benchmarking of performance measurement results. Transparent presentation of measurement results and related discussion acted as a facilitator of accountability during the development projects described. Such performance-oriented discussion between units was seemingly not commonly in place. However, there are many motivators for limiting transparency which were not revealed in the empirical examination of this study and which may be sustained regardless of existing performance measurement systems. Generally, such motivators can include the sustenance of prevailing power structures and status-quo (Termeer, 2009), fear for undesired and wrong interpretations (Smith, 1995) and simply the possible revelation of poor results. Performance measurement systems are often complex and still unfamiliar for many public servants (McAdam et al., 2005). Difficulties in understanding the logic of such systems may provide motivation to sustain limited transparency of performance measurement results in order to avoid potential undesired outcomes.

Asymmetrical communication can be regarded as an embodiment of vertical government (Michels and Meijer, 2008). The empirical observations revealed that focus on hierarchical entities instead of horizontal collaboration can have suboptimal consequences which are facilitated by existing

performance measurement and management control systems highlighting vertical organizational hierarchies not crossing departmental borders. In addition, there is much causality between departments and service-providing units, possibly misleading performance targets and suboptimal measures, which have been argued to have a negative effect on the performance of larger organizational entities such as cities (Smith, 1995).

The longitudinal empirical investigation has highlighted attempts, failures, and reorienting interventions in reaching the governmentality aims within the Helsinki smart city discourse. In particular, performance measurement as a technology of government (Miller and Rose, 1990) and the redefinition of its orientation, as well as solving interventions (Lemke, 2001) on administrative mechanisms and structures have been revealed. This shows how the exercise of power – expression of governmentality that takes place through the complex of institutions and procedures – should facilitate goal achievement (Foucault, 2009).

These reflections highlight the crucial role of government experts whose presence and active contribution may help to overcome possible reasons for failures when reorienting regimes of practices to desired aims (Rose and Miller, 1992; Söderström et al., 2014). In this regard, the role of the field researcher has been fundamental in identifying factors such as measurement deficiencies contributing to failures in reaching governmentality aims. Indeed, the empirical part also revealed that the City of Helsinki, with its complex and pluralist nature, has faced cultural difficulties in terms of transparency and communication, as well as technical challenges, i.e. suboptimal institutional and administrative structures and related dysfunctional performance measurement. These difficulties have at least partly affected the processes of reorienting regimes of practices to desired aims (Miller and Rose, 1990) by rendering governmentality a complex and certainly not a smooth activity.

6. Conclusions

In the time span explored in the longitudinal case study (2007–2013), we have seen that Helsinki in its smart city approach has offered a rationalization of power posed to city government practices by phenomena relating to its population (Foucault, 2008, p. 317), such as social, infrastructural, and emergency aspects and related services.

Within this smart city discourse, whose significance also includes enhancements in the citizens' quality of life, a promotion of an agile service development and transparency of city governance (Forum Virium Helsinki, 2015), a problematization area has emerged with specific forms of knowledge (Dean, 2010, p. 38). Indeed, the rationalization has implied both representations and intervention aspects (Lemke, 2001). The former aspect has characterized the first period of the

analysis (2007), involving vertical performance measurement referring to single organizational units. Forms of interventions have been shown with regard to the specific development programs introducing a horizontal perspective in the performance measurement (2011-2013) (Almqvist et al., 2013; Klijn, 2012).

Through the lens of the theoretical framework developed in section 2, the findings stemming from the case of the City of Helsinki show how a smart city pursuing governmentality goals, which are complex in nature, shapes and reshapes technologies of government to ensure that regimes of practices are oriented towards the achievement of desired aims.

The empirical part of the study was built on a unique long-term access to different organizational sub-units of the City of Helsinki in the midst of their endeavors towards utilizing performance measurement information for goal setting, collaboration, and communication. Drawing from this exceptional empirical visibility of these processes seldom revealed to outsiders (including researchers), our paper contributed by longitudinal empirical examination regarding the relationship between public governance and horizontal performance improvement. It examined performance measurement as a program and technology of government. The governing activity connected to performance measurement systems may stimulate developments which reorient regimes of practices by stimulating a shift in logics (i.e. from vertical to horizontally-oriented mindset) and transformations of institutional and administrative structures in line with cultural change. Indeed, performance measurement initiatives seem to potentially have wider impacts in smart city development than mere technological advancements. They can facilitate the identification of problems in administrative structures, communication, and transparency. More specifically, the horizontal and networked performance examination appears to have potential in streamlining operations and achieving societal and sustainability goals. Considering the role of specialists in a governmentality scenario (Rose and Miller, 1992), our analysis also highlighted how the researcher acted as a catalyst, stimulating a critical debate with different actors involved in the current performance measurement and fostering horizontal accountability towards a bio-political dimension.

This study identified several challenges regarding the achievement of ideal goals of a smart city. Further research could analyze the causes of these challenges in more detail. Also comparative analysis between similar cities could be carried out to understand the possible context-specific nature of observations.

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