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Dynamic Capabilities in Public Organizations

Erk P. Piening

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Abstract

This article provides a review and synthesis of the extant literature on dynamic capabilities in public organizations. Although this theoretical perspective holds potential to enhance our limited understanding of how public organizations change in response to their increasingly turbulent and complex environments, it has received little attention in the public management field. Against this backdrop, this article seeks to contribute to future research on public sector change by advancing an analytical model that captures the antecedents, microfoundations and effects of dynamic capabilities in public organizations.

Key words

Dynamic capabilities, public sector, organizational change, performance

DYNAMIC CAPABILITIES IN PUBLIC ORGANIZATIONS

A literature review and research agenda

Erk P. Piening

Erk P. Piening
Faculty of Economics and Management
Institute of Human Resource Management
Leibniz University Hannover
Königsworther Platz 1, 30167
Germany
E-mail: piening@pua.uni-hannover.de

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INTRODUCTION

Public sector organizations (PSOs) are confronted with demands to become more efficient and effective, especially given increasing financial cutbacks, the rising demand for services and the push towards performance-related management (Boyne *et al.*, 2005; Mack *et al.*, 2008; Radnor, 2010). Particularly, public managers are supposed to emulate managerial practices and innovations from the private sector in order to improve organizational performance (Boyne, 2002; Damanpour *et al.*, 2009; Palmer and Dunford, 2001; Walker *et al.*, 2002). Yet, implementing change is a challenging task, especially in the public sector where managers have to satisfy multiple, supposedly conflicting goals imposed upon them by numerous stakeholders (Fernandez and Rainey, 2006; Osborne and Brown, 2005; Rashman *et al.*, 2009). Moreover, as the competitive pressure in terms of risk of closure or takeover is lower in the public sector, incentives for far-reaching transformation are often absent (Jas and Skelcher, 2005). As a result, empirical evidence highlights that many PSOs struggle to adapt to changing market conditions as change initiatives such as the adoption of administrative and technological innovations frequently lose steam in the implementation stage or fail to realize the intended benefits (Borins, 2001; McNulty and Ferlie, 2004; Ridder *et al.*, 2005).

Although existing research has addressed a variety of change related issues, insights into how PSOs actually adapt to changing conditions or why many organizations fail to do so remain limited (Klarner *et al.*, 2008; Osborne *et al.*, 2008; Pablo *et al.*, 2007). Apart from prevailing conceptual and methodological issues, this shortcoming is due to the fact that only a few studies have delved into the underlying processes of organizational change in PSOs. For example, while there are many studies that shed light on both antecedents and outcomes of innovation activities in PSOs, the innovation process itself has been typically treated as a black box (McNulty and Ferlie, 2002; Osborne and Brown, 2005; Piening, 2011).

In the private sector literature, the dynamic capability approach has become a prevalent theoretical framework for analysing how firms change. Dynamic capabilities are defined as the 'ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments' (Teece *et al.*, 1997: 516). Especially in high-velocity markets, dynamic capabilities are recognized as a source of sustained competitive advantage and a prerequisite for long-term organizational survival (Ambrosini and Bowman, 2009; Eisenhardt and Martin, 2000; Zahra *et al.*, 2006). As it is argued that many organizations in the public sector are facing even more environmental change than private sector firms (e.g. due to frequent policy changes), these capabilities are increasingly seen as a critical success factor for PSOs (Pablo *et al.*, 2007; Salge and Vera, 2011). In a similar vein, Bryson *et al.* (2007) stress that an essential key to success for PSOs is identifying and building capabilities to produce the greatest public value for key stakeholders at a reasonable cost. Without continuously renewing these capabilities through dynamic capabilities, they will find it difficult to respond effectively to changes in their environments. However, with notable

exceptions this theoretical perspective has received scant attention in the public management field (Pablo *et al.*, 2007; Oliver and Holzinger, 2008; Harvey *et al.,* 2010). There is little insight into how PSOs develop and deploy dynamic capabilities, how dynamic capabilities affect their performance, and whether there are differences between dynamic capabilities in private and public sector firms. Given the struggles of many PSOs to adapt to changing conditions, one might even doubt whether there actually are such capabilities in the public sector.

This article aims to review and synthesize the extant literature on dynamic capabilities in PSOs in order to contribute to our understanding of the nature and effects of such capabilities in the public sector. In doing this, the article provides a theoretical basis for future research on organizational change in PSOs and can aid public managers in thinking about how to implement change. As the dynamic capability approach explicitly focuses on the organizational processes through which firms manage innovation-related activities, this theoretical perspective holds promise to unravel the aforementioned process black box in public management research. While prior literature reviews (e.g. Fernandez and Rainey, 2006) have predominantly focused on the individual level of analysis, i.e. the role of top and middle managers or politicians in explaining innovation, adopting such an organizational level perspective can contribute to a more comprehensive understanding of innovation processes in the public sector. In particular, dynamic capabilities consist of patterned behaviour that firms can invoke on a repeated rather than idiosyncratic basis (Helfat *et al.*, 2007; Teece *et al.*, 1997). These reliable problem-solving patterns capture the lessons learned from previous experiences, allowing an organization to approach new problems in a systematic and coordinated way (Winter, 2003). As such, they help organizations to deal with the uncertainty and complexity inherent to innovation processes. Thus, the observation that frequent policy changes (Pablo *et al.* 2007), a strong reliance on ad hoc problem-solving procedures (Gilmore and Krantz, 1991), and high turnover rates among elected or appointed top managers (McCabe *et al.*, 2008) can diminish the ability of PSOs to implement change underlines the potential value of dynamic capabilities in public sector settings.

The article is organized as follows. In the next section, I take stock of the literature on dynamic capabilities to clarify the nature and functioning of these capabilities. Based on these theoretical foundations, prior research on dynamic capabilities in public organizations is reviewed. Integrating the two research streams, I develop an analytical model that specifies the microfoundations, antecedents and effects of dynamic capabilities in PSOs. Finally, this model and implications for future research are discussed.

DYNAMIC CAPABILITIES: CONCEPTUAL FOUNDATIONS

Strategic management research focuses on how firms generate and sustain competitive advantage. Within this field, the resource-based view (RBV) is one of the most widely accepted theoretical perspectives. The RBV is based on the assumptions that resources

are heterogeneously distributed across firms and that such heterogeneity persists over time as resources are imperfectly mobile (Barney, 1991; Peteraf, 1993). In particular, to be a source of sustained competitive advantage Barney (1991) proposes that resources must meet the four criteria of value, rarity, imperfect imitability and non-substitutability. In this regard, several authors put their emphasis on the distinction between resources and organizational capabilities. While a resource refers to an input to production that a firms owns, controls or has access to on a semi-permanent basis, a capability describes the firm's capacity to deploy resources to achieve a desired outcome (Amit and Shoemaker, 1993; Helfat and Peteraf, 2003). Yet, in contexts where technological, regulatory and competitive conditions change rapidly, persistence in the same capabilities can become harmful (Schreyögg and Kliesch-Eberl, 2007; Zollo and Winter, 2002). Core capabilities can turn into core rigidities (Leonard-Barton, 1992). This observation has led to the suggestion that a competitive advantage can only be sustained if an organization has the capacity to purposefully renew its capabilities, or what might be referred to as dynamic capabilities (Teece *et al.*, 1997).

Research has referred to learning (e.g. R&D activities), new product and process development, alliancing, as well as strategic decision making and resource allocating as examples of dynamic capabilities as these capabilities permit the extension and reconfiguration of a firm's resource base (Ambrosini and Bowman, 2009; Helfat *et al.*, 2007; Teece, 2007). A firm's ability to develop product innovations is seen as a prime example of a dynamic capability. Product innovations activities are described as collective learning processes that involve carrying out 'new combinations' of knowledge and other resources. As organizations systematically acquire, integrate and exploit resources in order to generate new products, these activities foster the development of new capabilities (Danneels, 2002; Eisenhardt and Martin, 2000). In particular, dynamic product innovation capabilities are based on a firm's ability to build new customer competencies (e.g. identifying new customers, developing knowledge about their preferences, and setting up new distribution and sales channels) and technological competencies (e.g. identifying and learning to use new technologies, hiring engineers in new technical areas and implementing new production processes) (Danneels, 2008). Capabilities to manage alliances (e.g. with suppliers or universities), joint ventures, and firm acquisitions are further examples of dynamic capabilities that strengthen a firm's asset position by gaining access to new, external resources and capabilities (Eisenhardt and Martin, 2000; Keil, 2004).[1]

However, despite the potentially valuable contribution of dynamic capabilities to our understanding of change-related issues many scholars remain sceptical about the value of this theoretical perspective (Winter, 2003). Dynamic capabilities have been criticized for being tautological, conceptually vague and not sufficiently empirically grounded (Arend and Bromiley, 2009; Wang and Ahmed, 2007). Although an increasing number of studies addresses the question of what dynamic capabilities are and how they matter, there is discord about their nature and functioning among scholars (Gavetti, 2005; Helfat *et al.*, 2007). Perhaps the largest source of confusion is the lack of clarity about a coherent definition of dynamic capabilities. In defining these capabilities as abilities or

suggesting that dynamic capabilities are only those capabilities that result in competitive advantage, prior definitions are often inherently tautological (Arend and Bromiley, 2009; Barreto, 2010; Zahra *et al.*, 2006).

In contrast, Zollo and Winter (2002: 340) define dynamic capabilities as 'learned and stable pattern of collective activity through which the organization systematically generates and modifies its operating routines in pursuit of improved effectiveness'. By clearly distinguishing between dynamic capabilities and their effects (dynamic capabilities do not necessarily lead to improved performance), their definition has the advantage of not being tautological (see Helfat *et al.*, 2007). Based on this definition, the microfoundations, antecedents and effects of dynamic capabilities are described in the following sections.

Organizational routines as microfoundations of dynamic capabilities

A dynamic capability involves performing an activity such as new product development, using a collection of organizational routines to execute and coordinate the different tasks required to perform the activity (Eisenhardt and Martin, 2000; Helfat and Peteraf, 2003; Helfat *et al.* 2007). Accordingly, organizational routines are the 'building blocks' of dynamic capabilities, the mechanisms by which they are put into use (Parmigiani and Howard-Grenville, 2011; Teece, 2007). This does not imply that a dynamic capability is simply a routine. As a higher-order construct, dynamic capabilities not only encompass several interconnected routines but also require the use of different resources such as knowledge stored in databases or other input factors to perform their intended function (Dosi *et al.*, 2008; Makadok, 2001).[2]

Organizational routines are defined as 'repetitive, recognizable pattern of interdependent actions, involving multiple actors' (Feldman and Pentland, 2003: 96) or can be described as the way things are done in an organization (Becker and Zirpoli, 2008; Teece *et al.*, 1997). While traditionally conceptualized as mindless or automatic responses to certain stimuli (March and Simon, 1958; Nelson and Winter, 2002), more recent empirical work suggests that routines are effortful accomplishments (Feldman, 2000; Pentland and Rueter, 1994). The latter position highlights the role of agency in the enactment of routines. In particular, Feldman and Pentland (2003) propose that routines encompass an ostensive and a performative aspect. While the ostensive aspect is the structure or abstract idea of the routine, the performative aspect refers to the routine in practice. Accordingly, the same routine allows a variety of performances depending on the way in which organizational members enact the routine. This understanding of routines is grounded in the emerging field of practice theory which highlights the importance of considering the micro-social practices within organizations, i.e. how everyday practices or routines (the two terms are used more or less synonymously) are accomplished and changed (Feldman and Orlikowski, 2011; Parmigiani and Howard-Grenville, 2011).

However, the notion of dynamic capabilities as bundles of routines is based on the premise that an activity must have reached some level of routine activity, i.e. work in a reliable manner to qualify as a capability. Hence, brilliant improvisation or onetime change is not a dynamic capability (Helfat *et al.*, 2007; Winter, 2003). According to Teece *et al.* (1997), dynamic capabilities are based on routines for integration and coordination, learning and reconfiguration. First, integration and coordination routines involve combining resources. Examples of such routines include new product development in which managers form multifunctional teams combining various skills, expertise and assets in order to create new products (Bowman and Ambrosini, 2003). These activities require the effective coordination of a variety of tasks and resources as well as the synchronization of different activities. Next, learning allows tasks to be performed more effectively and efficiently as an outcome of experimentation. Finally, reconfiguration refers to the transformation and recombination of the organizations' existing resources (Teece *et al.*, 1997).

Subsequent research has identified further routines that can be recognized as providing certain microfoundations (Teece, 2007) for dynamic capabilities. Examples include routines for decision-making (Maritan, 2001), communication (Hargadon and Sutton, 1997), as well as routines directed at sensing (e.g. R&D), seizing (Pavlou and El Sawy, 2011), and knowledge codification (Keil, 2004). In essence, the literature suggests that different dynamic capabilities are underpinned by different sets of organizational routines (Helfat *et al.*, 2007).

Antecedents of dynamic capabilities – path dependency

With respect to the antecedents of dynamic capabilities, it is assumed that both their creation and usage are influenced by path dependency (Ambrosini and Bowman, 2009; Lavie, 2006; Teece *et al.*, 1997; Wang and Ahmed, 2007). In its most general form, path dependency is understood as a rephrasing of the simple statement that 'history matters'. Accordingly, organizations follow a certain trajectory or path of competence development that defines and narrows management's strategic choices (Teece *et al.*, 1997). However, the conceptualization of path dependency as put forth by Teece *et al.* (1997) has not gone unchallenged. In particular, their rather vague understanding of path dependency in terms of history matters has been criticized because such a ubiquitous, all-embracing understanding is close to a truism (Sydow *et al.*, 2009; Vergne and Durand, 2010). A more precise examination of this issue focuses on how path dependency shapes the underlying routines of dynamic capabilities. In essence, three main factors, namely the historical development of an organization, learning barriers and micropolitics explain why these routines are path-dependent.

First, a firm's repertoire of routines is viewed as a function of the organization's historical development, i.e. the experiences and resources accumulated over time (Howard-Grenville, 2005; Nelson and Winter, 2002). As Becker (2004: 653) puts it:

'Routines build on the past. How they will develop is a function of where they have started from'. The development of routines is based on experimental learning (learning-by-doing) and therefore requires the repeated execution of similar tasks. As a result, organizations can only build routines in operational or technical areas in which they have worked (accumulated experience) in the past (Zollo and Winter, 2002). Moreover, research suggests that firms develop routines around the use of existing resources such as technologies, giving rise to a self-reinforcing cycle of stability. Past investments in technologies or R&D involve sunk costs that are assumed to limit the scope for future actions (Edmondson *et al.*, 2001; Howard-Grenville, 2005).

Learning barriers are the second major factor that explains why routines change in a path-dependent manner (Becker, 2004; Levitt and March, 1988). Established routines persist because organizational learning tends to be local and cumulative, i.e. firms search for new problem-solving procedures in the neighbourhood of existing routines as these narrow searches promise better and more reliable results (Ahuja and Lampert, 2001; Levinthal and March, 1993). Increasing returns to experience, or what is known as positive feedback effects, are widely recognized in the literature (Becker, 2004; Sydow *et al.*, 2009; Vergne and Durant, 2010). A well-known example of positive-feedback effects are competency traps which refer to a situation where 'favourable performance with an inferior procedure leads an organization to accumulate more experience with it, thus keeping experience with a superior procedure inadequate to make it rewarding to use' (Levitt and March, 1988: 322). As learning or relearning routines has both direct and indirect costs, it is assumed that routines persist until and unless there is an impetus for change. Indeed, change in routine is problem directed. Firms are more likely to search for alternative routines when they experience failure (Gersick and Heckman, 1990; Nelson and Winter, 1982).

The third factor can be subsumed under the heading of micropolitics. Organizations are seen as political entities where individuals and groups with different interests and unequal power compete for limited resources. These actors tend to protect their self-interest when conflicting courses of action are possible (Espedal, 2006; Nelson and Winter, 2002). The metaphor of routines as 'truce' highlights that firm's stick with established routines to avoid uncertainty and conflict (Nelson and Winter, 1982; Zbaracki and Bergen, 2010). A routine represents a collective agreement about how to carry out a certain task, and thus reduces conflict (Feldman and Pentland, 2003). Departures from accepted routines provoke heightened anxieties and often involve heightened stakes (Nelson and Winter, 2002).

Dynamic capabilities and organizational performance

Finally, the effects of dynamic capabilities have been discussed controversially in the literature (e.g. Barreto, 2010; Cepeda and Vera, 2007). Based on a literature review Arend and Bromiley (2009: 76) conclude that 'scholars have portrayed dynamic

capabilities as direct drivers of competitive advantage, as preconditions, moderators, mediators and mediated or moderated drivers of firm performance or firm change, and as combinations thereof'. Again, many definitions of dynamic capabilities are inherently tautological as they confuse the existence of these capabilities with their effects (Wang and Ahmed, 2007; Zahra *et al.*, 2006). For example, by referring to dynamic capabilities as the 'ability to achieve new forms of competitive advantage' Teece *et al.* (1997: 515) suggest that dynamic capabilities are only those that lead to superior performance (see Easterby-Smith *et al.*, 2009; Zahra *et al.*, 2006).

In order to avoid this tautology, other scholars have proposed an indirect relationship between dynamic capabilities and competitive advantage (e.g. Helfat *et al.*, 2007; Wang and Ahmed, 2007; Zahra *et al.*, 2006). Accordingly, dynamic capabilities do not involve the production of goods or provision of marketable services. Instead, they indirectly affect the performance of organizations as they enable them to renew their operational capabilities, or more precisely, the routines that underpin these capabilities (Helfat and Peteraf, 2003; Salvato and Rerup, 2011; Zollo and Winter, 2002; Zott, 2003). In turn, operational capabilities guide the everyday activities of an organization such as logistics, marketing or manufacturing (Martin, 2011; Winter, 2003; Zahra *et al.*, 2006). In this reasoning, dynamic capabilities are not necessarily related to superior performance as change in the routines of an organization implies only that the organization is doing something different, but not inevitably better, than before (Helfat *et al.*, 2007). Since dynamic capabilities themselves can become dysfunctional due to changing environmental conditions, Helfat *et al.* (2007) argue that one dynamic capability (e.g. for learning) may help to alter operational as well as other dynamic capabilities. However, the assumption that dynamic capabilities are indirectly related to firm performance has received some empirical support in recent years (Pavlou and El Sawy, 2011).

Furthermore, research suggests that the performance of dynamic capabilities is moderated by context factors, most notably market dynamism (Eisenhardt and Martin, 2000; Wang and Ahmed, 2007). Accordingly, it is assumed that the use and usefulness of dynamic capabilities is greater in dynamic than in stable environments (Zahra *et al.*, 2006; Zollo and Winter, 2002). To account for this context dependency, Helfat *et al.* (2007) propose two yardsticks for measuring how well or poorly dynamic capabilities perform. On the one hand, evolutionary fitness measures how well a dynamic capability enables an organization to make a living by creating or modifying its operational capabilities. This external measure captures how well a capability match the requirements (e.g. market demands) of the particular context in which a firm operates. One the other hand, technical fitness provides an internal measure of how efficiently a dynamic capability performs its intended function. Technical fitness depends not only on the quality of a capability but also on the costs of its development or usage.

In sum, dynamic capabilities can be described as bundles of interrelated routines which, shaped by path dependency, enable an organization to renew its operational capabilities in pursuit of improved performance. Based on these theoretical

considerations, the literature on dynamic capabilities in public organizations in reviewed in the next section.

DYNAMIC CAPABILITIES IN THE PUBLIC SECTOR: STATE OF THE ART

Dynamic capabilities are embedded in contexts and can only be studied as such. In order to reveal how dynamic capabilities operate in PSOs, it is therefore necessary to discuss the characteristics of the public sector first. Despite some similarities, there are important differences between public and private sector organizations such as their ownership, i.e. private firms are owned by entrepreneurs or shareholders whereas public organizations are collectively owned by members of political communities. A variety of other distinguishing characteristics have been proposed (e.g. Andrews *et al.*, 2011; Boyne, 2002; Perry and Rainey, 1988). In this respect, it has to be noted, first, that no organization is wholly public or private. Instead, the degree of publicness can be considered along a continuum ranging from low to high (Bozeman, 1987). On such a continuum, public organizations are, for example, assumed to face less intense competitive pressures than their private counterparts. Moreover, as PSOs are mainly funded by taxation rather than fees paid directly by customers they are predominantly controlled by political not market forces (Andrews *et al.*, 2011; Boyne, 2002; Nutt and Backoff, 1993). Probably, the most obvious difference between public and private applies to their distinctive goals. The goals of PSOs such as the creation of public value or accountability have been described as more multiple, conflicting, vague, intangible and hard-to-measure than those of private organizations. In contrast, the dominant goal of private firms, namely profit, is fairly clear and measurable (Nutt and Backoff, 1993; Perry and Rainey, 1988). Due to the absence of market mechanisms, it is often assumed that PSOs have less incentive to cost reductions, operating efficiency and organizational effectiveness. In short, they have less incentive to innovate (Boyne, 2002; Jas and Skelcher, 2005).

In light of the outlined environmental and structural differences between public and private firms, many scholars have questioned whether strategic management concepts from the for-profit literature are readily applicable in the public sector (e.g. Nutt and Backoff, 1993). Foremost, it has been argued that their applicability is limited because public managers have less control over strategy formulation and implementation than their private-sector counterparts. The dominance of central government imperatives over PSOs through auditing and target-setting, combined with central control over resources, sets limits on the degree of strategic choice available (Bryson *et al.*, 2010). Doubts have also been expressed with respect to the usefulness of resource-based theories in public sector settings since these concepts are primarily based on the notion of competition and customers. For example, resource-based theorists proceed from the assumption that an organization's distinctiveness and competitiveness is based on its firm-specific, not easily imitable resources and capabilities (Barney, 1991; Teece *et al.*,

1997). Accordingly, firms must protect their knowledge form appropriation by rivals in order to sustain competitive advantages. In contrast, PSOs have been encouraged to share and spread innovation and best practices in order to create public value (Rashman *et al.*, 2009). They are often expected to collaborate with other organizations providing similar services and not compete for customers (Nutt and Backoff, 1993).

Nevertheless, in line with other authors I argue that the dynamic capability approach is in principle applicable to the analysis of organizational behaviour in the public sector. Like for-profit firms, PSOs function as a collection of resources and organizational routines aimed at fulfilling policy initiatives and providing services (Bryson *et al.*, 2007; Harvey *et al.*, 2010; Pablo *et al.*, 2007). Consequently, the outlined definition of dynamic capabilities proposed by Zollo and Winter (2002) applies to private as well as public sector organizations as both types of organizations modify their operational routines in pursuit of improved effectiveness.

Yet, in spite of the explanatory potential of the dynamic capability approach this theoretical perspective has received comparably little attention in the public management literature (e.g. Pablo *et al.*, 2007; Oliver and Holzinger, 2008). Table 1 summarizes the state of the art on dynamic capabilities in PSOs. This review is not exhaustive, but rather intended to provide an overview about the most relevant and more recent work on this topic.

Table 1 shows, first, that in the public sector dynamic capabilities have been studied in various countries (e.g. UK, Germany, US and Australia) and organizational contexts such as hospitals or other health care organizations, local authorities and public schools. The methodologies used in these studies vary considerably, ranging from in-depth case studies to large-scale cross-sectional studies (using survey or secondary data), while a few mixed-method studies combine qualitative and quantitative methods. However, compared to the strategic management field that is dominated by quantitative methods (Ambrosini and Bowman, 2009) the frequent use of qualitative approaches in the reviewed studies is noteworthy. Drawing on the distinction between microfoundations, antecedents and effects of dynamic capabilities, the findings of these studies are presented in detail in the next section.

Microfoundations of dynamic capabilities in PSOs

A first group of studies listed in Table 1 draws on quantitative survey data to analyse dynamic capabilities and their impact in public organizations. These studies show that PSOs benefit from having dynamic capabilities such as reshaping capabilities (Jones *et al.*, 2005), knowledge sharing capabilities (Lee, 2001) or managerial capabilities (Carmeli and Tishler, 2004). For example, the ability to implement information technology in a state government department is based on reshaping capabilities that are based on practices for employee engagement, resource development and performance management (Jones *et al.*, 2005).

Table 1: Empirical research on dynamic capabilities in the public sector

Study	*Type of study*	*Sample and method*	*Research focus*	*Key findings*
1. Lee (2001)	Quantitative	195 government offices in Korea; Survey data	Examines the relationship between knowledge sharing and information systems outsourcing success (*microfoundations and effects of DCs*)	Finds that the degree of knowledge sharing (both explicit and implicit knowledge) between service provider and service receiver influences the success of information systems outsourcing. This relationship is moderated by the service receiver's level of absorptive capacity
2. Daniel and Wilson (2003)	Qualitative	5 organizations from different industries in the UK including a local government agency; Case study	Analyse the nature and development of dynamic capabilities, across different industries, which are necessary for e-business transformation (*microfoundations and effects of DCs*)	In order to be able to develop successful e-business services, all organizations reconfigured and extended their resource bases by deploying different dynamic capabilities. These capabilities refer, for example, to the organizations' ability to build commitment to change both within the organization and with external stakeholders or its ability to integrate e-business processes into the existing activities Findings suggest that learning-by-doing is the primary mechanism through which organizations build dynamic as well as operational capabilities. Cross functional teams support capability building

(*continued*)

Table 1: (*Continued*)

Study	*Type of study*	*Sample and method*	*Research focus*	*Key findings*
3. Carmeli and Tishler (2004)	Quantitative	99 local authorities in Israel; Survey and secondary data	Test the relationship between intangible resources (capabilities) and various performance measures (*microfoundations and effects of DCs*)	Results indicate that intangible resources such as human capital, organizational culture or managerial capabilities (together with environmental uncertainty and geographical location) strongly affect the performance of local authorities (e.g. self-income ratio or employment rate)
4. McNulty and Ferlie (2004)	Qualitative	Case Study in a UK National Health Service (NHS) hospital	Processual analysis of the implementation of business process reengineering (BPR) (*antecedents of DCs*)	Observe that the hospital change incrementally (in a path dependent manner) rather than achieving radical process redesign as intended. As BPR is more 'rhetoric than reality' in the organization, its impact on performance measures such as length of patient stay is limited Highlight the negative influence of learning traps (insufficient dissatisfaction with existing operational processes or lack of customer pressure), structural rigidities, employee resistance to change and conflicts (e.g. collaboration of physicians and middle

(*continued*)

Table 1: (*Continued*)

Study	*Type of study*	*Sample and method*	*Research focus*	*Key findings*
				managers against senior management and external change agents) on BPR implementation
5. Jas and Skelcher (2005)	Qualitative	15 'poorly performing' English local authorities; Longitudinal case study	Examine the relationship between performance decline and turnaround (*microfoundations and antecedents of DCs*)	Find that the performance of PSOs over time is cyclical. As performance declines, there is pressure to initiate turnaround and performance improvement. As organizations experience success, incentives for continuous improvement are absent Find that organizations fail to initiate organizational restructuring when they are not aware of their poor performance or lack leadership capabilities. These dynamic capabilities which reside in a small group of senior politicians and managers refer to the ability to take appropriate actions when the organization faces signs of performance decline
6. Jones *et al.* (2005)	Quantitative	67 employees of a state government department in Queensland, Australia	Address how reshaping capabilities influence the implementation of a new end-user computing system	Find that reshaping capabilities affect implementation success (innovation usage) indirectly via their positive

(*continued*)

Table 1: (*Continued*)

Study	*Type of study*	*Sample and method*	*Research focus*	*Key findings*
			(*microfoundations and effects of dynamic capabilities*)	effect on employee's perception of the organizations' readiness for change Reshaping capabilities help to reduce resistance to change as these capabilities ensure the effective provision of information to the targeted innovation users or their participation in the implementation process
7. Ridder *et al.* (2005)	Qualitative	Multiple case study of 6 municipalities in Germany	Examine the underlying dynamics that shape the implementation of accrual accounting and output-based budgeting (*microfoundations, antecedents and effects of DCs*)	Highlight that municipalities change in a path dependent manner. In particular, implementation processes are shaped by dynamics specific to the particular organization such as the resistance of executives or distinctive organizational routines such as coordination principles (e.g. project teams and their collaboration routines) Find that resource constraints are a major implementation barrier. As large municipalities are more likely have slack resources, they are able to provide more training to their employees in order to support the sufficient application of the

(*continued*)

Table 1: (*Continued*)

Study	*Type of study*	*Sample and method*	*Research focus*	*Key findings*
				new accounting and budgeting procedures Conclude that many municipalities lack dynamic capabilities that enable them to transfer of new rules or procedures into the day-to-day routines of the organization
8. Vera and Crossan (2005)	Quantitative and qualitative	38 teams in a large US municipality; Survey data of 232 employees and qualitative data stemming from 20 interviews	The study examines improvisation capabilities of work teams and their impact on the teams' ability to introduce service innovations (*microfoundations and effects of DCs*)	Find that improvisation is not inherently good or bad for innovation. The results suggest that improvisation only leads to innovation when combined with moderating factors such as domain- and task-relevant expertise of the team members or effective team routines for collaboration and communication Find that training increases the incident and effectiveness of improvisational processes
9. Pablo *et al.* (2007)	Qualitative	Case study of a regional health authority in Canada	Analyse how public managers use dynamic capabilities to improve performance, while being constrained by diminishing financial resources (*microfoundations of DCs*)	Find that the process of developing and implementing dynamic capabilities occurs in three overlapping phases: The identification of the dynamic capability (in this case, the capability of learning through experimenting),

(*continued*)

Table 1: (*Continued*)

Study	*Type of study*	*Sample and method*	*Research focus*	*Key findings*
				enabling the dynamic capability(e.g. supportive leadership style to encourage personal initiative and trusting relationships), and managing the ongoing tensions Highlight that managerial skills and commitment are essential in identifying, enabling and managing the use of dynamic capabilities
10. Ridder *et al.* (2007)	Qualitative	6 clinical departments of a public hospital group in Germany; Case study	Examine the adaptation processes of clinical departments in response to the implementation of a reimbursement system based on Diagnosis Related Groups (DRGs) (*microfoundations, antecedents and effects of DCs*)	Find that the ability of clinical departments to develop new operational capabilities or reconfigure existing capabilities in order to deal with the new reimbursement system depends on their evolutionary path and distinctive dynamic capabilities (e.g. learning and coordination processes) Highlight that successful and unsuccessful department's deal differently with resource constraints. For example, successful hospitals tend to mobilize additional financial and personnel resources to foster the implementation of DRGs

(*continued*)

Table 1: (*Continued*)

Study	*Type of study*	*Sample and method*	*Research focus*	*Key findings*
				Find that the level of acceptance of the DRG-system among employees influences the effectiveness of capability building
11. Wilson and Daniel (2007)	Qualitative	Multiple case study of 4 organizations (public and private) from different industry sectors and countries	Seek to understand the role of dynamic capabilities in channel transformation, that is, an organization's deployment of marketing and sales channels to modify its strategy (*microfoundations of DCs*)	Identify several dynamic capabilities that underpin channel transformation. Of these, they categorize some capabilities as innovation-related such as the ability to constantly review the organizations' route-to-the market or the creation of innovative channel combinations for different client groups
12. Easterby-Smith *et al.* (2008)	Qualitative	Comparative case study of 3 firms from different sectors (including a public hospital trust)	Seek to unearth the underlying processes of the absorptive capacity construct (*microfoundations and antecedents of DCs*)	Find that organizational crisis is an important trigger for the development of absorptive capacity. In the studied cases, absorptive capacity is based on processes which support the acquisition of external information (e.g. boundary spanning) as well as internal routines for knowledge gathering and utilization (e.g. regular team meetings) Highlight the role of organizational power in relation to absorptive capacity.

(*continued*)

Table 1: (*Continued*)

Study	*Type of study*	*Sample and method*	*Research focus*	*Key findings*
				Political behaviour of individuals and groups (e.g. uncooperative behaviour) influences the adoption and usage of external information
13. Fernandez and Wise (2010)	Quantitative	532 public school districts in Texas; Survey and secondary data	Seek to identify factors that explain the adoption of a staffing innovation. The study focuses on the processes of performance and resource evaluation as triggers for innovation (*antecedents of DCs*)	Find that the adoption of innovation is influenced by the amount of slack resources. As innovations have both direct and indirect costs, PSOs are more likely to invest in and implement innovations effectively when they have sufficient financial resources Corroborate that innovative search is 'problem directed'. Organizations are more likely to search for novel solutions and adopt innovations when managers' perceive a deficit in organizational performance
14. Guimarães *et al.* (2011)	Qualitative	Longitudinal case study of the Superior Tribunal of Justice in Brazil	Analyse how the introduction of a new management model changes working processes, routines and management behaviours (*microfoundations and effects of DCs*)	Highlight that innovation is associated with change in routine. Following the adoption of a new management model, the studied organization has established new operational capabilities such as an electronic court management which includes routines

(*continued*)

Table 1: (*Continued*)

Study	*Type of study*	*Sample and method*	*Research focus*	*Key findings*
				for the reception, access, and control of the evidence or documents from the cases being judged Find that information technology and project management techniques (e.g. preparation of staff members) support the development of operational capabilities
15. Piening (2011)	Quantitative and qualitative	5 hospitals of a state-owned hospital group in Germany; Mixed-method case study combining qualitative process and quantitative performance data	Analyses how dynamic capabilities shape the implementation of process innovations (*microfoundations, antecedents and effects of DCs*)	Highlights that dynamic capabilities encompass an ostensive and a performative aspect. Path dependency (e.g. the perception of resource constraints or learning traps such as time pressure or positive feedback effects) influence the ostensive aspect of dynamic capabilities, i.e. how managers enact their underlying routines Finds that dynamic implementation capabilities in hospitals mainly consist of 'everyday routines' such as communication procedures Corroborates that dynamic capabilities are indirectly related to organizational performance

(*continued*)

Table 1: (*Continued*)

Study	*Type of study*	*Sample and method*	*Research focus*	*Key findings*
16. Salge (2011)	Quantitative	154 public hospital organizations in the English National Health Service (NHS); Panel data	Focuses the generative mechanisms and underlying contingencies of innovative search processes (*antecedents of DCs*)	Supports the assumption that performance problems and slack resources increase the likelihood of innovative search, i.e. the search for novel products, services and processes Finds that the search intensity of organizations increases with their level of regulatory endorsement

Vera and Crossan (2005) employ a triangulation strategy by using qualitative data to interpret and corroborate their quantitative findings. Their study suggests that dynamic improvisation capabilities of teams are based on communication (e.g. frequent knowledge sharing between team members) and training routines. Likewise, qualitative studies indicate that effective routines for the coordination of activities (e.g. cross-functional teams), communication, and learning (e.g. knowledge codification or employee training) are important ingredients of successful change activities in public organizations (Guimarães *et al.*, 2011; Piening, 2011; Ridder *et al.*, 2005, 2007). Moreover, Easterby-Smith *et al.* (2008) focus on the underlying processes of the organizations' absorptive capacity, i.e. its ability to recognize the value of external information, assimilate it, and apply it to productive ends. Drawing on a case study of a rural hospital, they show that this specific dynamic capability comprises, on the one hand, routines for the acquisition and assimilation of external information such as boundary spanning activities of managers. On the other hand, this capability is based on routines for the internal gathering and transfer of information. Examples of these routines include weekly meetings between senior managers and cross-functional discussion forums.

Further studies (Daniel and Wilson, 2003; Wilson and Daniel, 2007) use a research approach which has been critically referred to as 'post hoc' identification of dynamic capabilities, that is, inferring their existence from successful organizational outcomes. Accordingly, when an organization reveals high organizational or innovative performance in dynamic environments this organization is per definition assumed to possess dynamic capabilities (Zahra *et al.*, 2006). For example, in their case study Daniel and Wilson (2003) find commonalities between organizations from different industries, which underwent successful e-business transformation? They identify eight dynamic capabilities such as the organizations' ability to build commitment to change that enable e-business transformation.

Apart from the use of dynamic capabilities, a few studies also address how organizations initially develop dynamic capabilities. Pablo *et al.*'s (2007) findings indicate that the development and implementation of dynamic capabilities in PSOs comprises three basic phases. In response to pressures for improved performance, the studied health authority first identified 'learning through experimenting' as a potentially useful dynamic capability. This capability refers to trials of managerial and practice innovations (small scale experiments) in order to evaluate their appropriateness for a regular use. The second phase is about enabling experimentation processes in the organization. Activities directed at the integration and combination of the knowledge and skills of employees such as the development of strong trusting relationships through leadership characterize this phase. Finally, establishing dynamic capabilities involve the management of ongoing tensions by balancing the enthusiasm to innovate with the need to exploit existent operational capabilities. In sum, Pablo *et al.* (2007) emphasize the critical role played by public managers in implementing dynamic capabilities. Piening (2011) adds further insight into the influence of managerial cognition and behaviour on

the use of dynamic capabilities. His study of the implementation of a process innovation in five hospitals suggests that dynamic capabilities comprise an ostensive and a performative aspect. While successful and unsuccessful implementers share some commonalities with respect to the structure of dynamic capabilities (ostensive aspect), in practice they used these capabilities quite differently (performative aspect). In accordance with the notion of routines as effortful accomplishments, hospitals are shown to use established dynamic capabilities selectively. Whether and how extensively hospital managers deploy dynamic implementation capabilities, i.e. the underlying routines such as communication or search procedures, depends on their perception of the necessity to adopt the innovation, time pressure and resource constraints.

Antecedents of dynamic capabilities in PSOs

Path dependency is a widely recognized phenomenon in the public management literature, both at the policy and organizational level. In view of the inability of many PSOs to change, it has been argued that the best predictor of what these organizations will do tomorrow is what they do today (Meier *et al.*, 2007). Correspondingly, the findings presented in Table 1 suggest that change in PSOs is path-dependent and often incremental rather than radical in nature. Nevertheless, it should be noted that strong path dependency is not necessarily related to innovation barriers as examples of exceptionally innovative public organizations show. But at least in the long run, path dependency leads to a narrower set of options.

For example, some studies point to the negative influence of micropolitics such as the employees' resistance to change or conflicts between organizational members (McNulty and Ferlie, 2004; Ridder *et al.*, 2007). Empirical evidence reveals, however, that particularly learning barriers such as competency traps explain why many PSOs lack innovativeness or to fail adapt to changing environmental conditions in general (Fernandez and Wise, 2010; Jas and Skelcher, 2005; Salge, 2011). Corroborating the assumption that organizational search is problemistic, Jas and Skelcher (2005) show that performance declines provide an impetus to initiate turnaround and performance improvement in PSOs. In contrast, when organizations experience success incentives for change are absent. Taken together, they confirm the notion that 'success breeds failure'. Likewise, low performance has been shown to increase the likelihood that school districts adopt staffing innovations (Fernandez and Wise, 2010) or that public hospitals search for new products or service improvements (Salge, 2011). These studies highlight that performance evaluation, i.e. manager's assessment of organizational performance relative to aspiration levels is an important antecedent to organizational change in PSOs. Specifically, performance evaluation processes are shown to influence the deployment of dynamic capabilities (e.g. Easterby-Smith *et al.*, 2008). For example, whether hospitals use their dynamic capabilities extensively in order to implement

innovations depends on the managers' perception of the need to improve existing care giving processes. When the adoption of innovations is mainly motivated by external (normative) pressure, hospitals put less effort into the implementation (Piening, 2011).

Yet, a contrary point of view argues that performance crises inhibit change as low performance reduces organizational slack, i.e. the level of uncommitted organizational and financial resources (Mone *et al.*, 1998). Accordingly, it is assumed that organizations are more likely to innovate when they have sufficient resources to engage in costly search activities or to compensate the risk associated with change (Salge, 2011; Walker, 2008). Thus, necessity can be seen as both the 'mother of invention and rigidity' (Kelman, 2006; Mone *et al.*, 1998). However, contradictory results emerge from empirical work on the influence of slack resources in public organizations. Drawing on a sample of 88 public schools, Koberg (1987) analyses how and why PSOs adjust to changing environmental conditions. His findings suggest that managers' perception of resource scarcity give rise to process, structural and strategic adjustments. At the same time, research indicates that PSOs with ample financial resources are more likely to adopt innovations (Fernandez and Wise, 2010), while other studies reveal that slack resources have little influence on public organizations' propensity to innovate (Brudney and Selden, 1995; Walker, 2008).

In a more fine-grained appreciation of organizational search processes, Salge (2001) reveals that the processes of problemistic and slack search are closely intertwined. His findings suggest that PSOs with high levels of slack are more likely to engage in problemistic search following performance decline. In essence, this study points to the conclusion that managers' perception of events and available resources influences their subsequent behaviours. Similarly, it has been shown that existing resources such as financial, personnel and structural resources shape the way PSOs use dynamic capabilities in planned organizational change. The managements' perception of its scope for action with respect to the available resources influences the intensity of innovation efforts (Piening, 2011; Ridder *et al.*, 2005, 2007). In this regard, Pablo *et al.* (2007) emphasize the costs (cognitive, managerial and operational costs) of dynamic capabilities. They conclude that deploying dynamic capabilities requires high levels of time and energy from committed managers.

Effects of dynamic capabilities in PSOs

Finally, as shown in Table 1, research sheds light on the impact of dynamic capabilities in PSOs. On the one hand, there is evidence for a direct relationship between different dynamic capabilities and various performance measures such as the success of information system outsourcing (Lee, 2001) or self-income ratio and employment rate (Carmeli and Tishler, 2004). Moreover, findings by Vera and Crossan (2005) suggest that improvisation capabilities are positively related to the introduction of service or product innovations in municipalities. Yet, these studies do not account for the precise

mechanisms through which dynamic capabilities shape performance outcomes and examine the mediating role of operational capabilities.

One the other hand, research indicates that dynamic capabilities operate on, i.e. extend, modify or create the organizations' operational capabilities. For example, Ridder *et al*. (2007) show that dynamic capabilities enable clinical departments to adapt to a new reimbursement system by guiding the development of new operational capabilities for medical coding as well as the reconfiguration of existing treatment processes. In turn, superior capabilities for coding have positive performance effects by ensuring high reimbursement rates. Likewise, dynamic capabilities have been shown to indirectly influence the effectiveness of process innovations (impact on patient length of stay) in hospitals. As bundles of different routines, dynamic capabilities enable hospitals to perform the activities necessary to implement innovations. Whether hospitals achieve implementation effectiveness, i.e. the consistent and appropriate use of the innovation depends on the quality and actual deployment of their implementation capabilities. Implementation effectiveness is, in turn, shown to be a necessary condition for the intended length of stay reductions (Piening, 2011). The results of Jones *et al*. (2005) are also supportive for the assumption of a mediated relationship between dynamic capabilities and firm performance. They show that with respect to the adoption of technological innovations, reshaping capabilities lead to high levels of user satisfaction and innovation usage, via their effects on employees' perceptions of readiness for change.

Most notably, empirical evidence provides insight into how dynamic capabilities operate. Based on the observation that innovation processes in PSOs involve change in the organizations' operational capabilities (e.g. Guimarães *et al.*, 2011; Ridder *et al.*, 2007), research suggests that dynamic capabilities guide the learning processes that underlie capability building. Consequently, most routines indentified in the literature review such as knowledge integration and codification, communication, and training routines are those which are generally assumed to facilitate organizational learning and capability development (Zollo and Winter, 2002). For example, in the context of innovation adoption such routines are shown to enable and motivate employees to use an innovation consistently and appropriately. This in turn enables public organizations to accumulate experience with the innovation and hence to establish effective operational routines for its continuing use (Piening, 2011). Likewise, Daniel and Wilson's (2003) findings highlight that learning-by-doing is the primary process through which dynamic capabilities operate.

ADVANCING AN ANALYTICAL MODEL AND PROPOSITIONS

Thus far, I have reviewed the growing literature on dynamic capabilities in PSOs. In this section, I synthesize the conceptual foundation of the dynamic capability approach and these empirical findings towards a more integrative understanding of the nature and

functioning of dynamic capabilities in the specific context of the public sector. Therefore, I propose the following model that captures the microfoundations, antecedents and effects of dynamic capabilities in PSOs, as shown in Figure 1.

First, the literature review supports the assumption that path dependency is an important antecedent of dynamic capabilities (Ambrosini and Bowman, 2009; Keil, 2004; Lavie, 2006; Teece *et al.*, 1997). As depicted in Figure 1, it can be assumed that both the ostensive and performative aspects of dynamic capabilities in PSOs are subject to path dependency. In particular, learning barriers have been shown to influence how public organizations engage in organizational change activities. Whether and how extensively an organization searches for novel solutions (e.g. Fernandez and Wise, 2010; Jas and Skelcher, 2005; McNulty and Ferlie, 2004) or explicitly employs dynamic capabilities (Pablo *et al.*, 2007; Piening, 2011) depends on the decision makers' perception of the necessity to change. Accordingly, public managers engage in *performance evaluation* processes in which they compare the actual organizational performance (e.g. in terms of service quality, client satisfaction and regulatory endorsement) to their goals or aspiration levels. The performance aspirations of public managers are not only based on their organizations' past performance and the performance of peer organizations, but are also a function of external stakeholder demands (e.g. governmental obligations) (Salge, 2011). Search for new, improved capabilities is initiated when decision makers find that performance is below their aspiration level. Likewise, Zahra *et al.* (2006: 931) argue that 'lack of success with current substantive capabilities increases the development and use of dynamic capabilities'. In this respect, public managers receive regular performance feedback

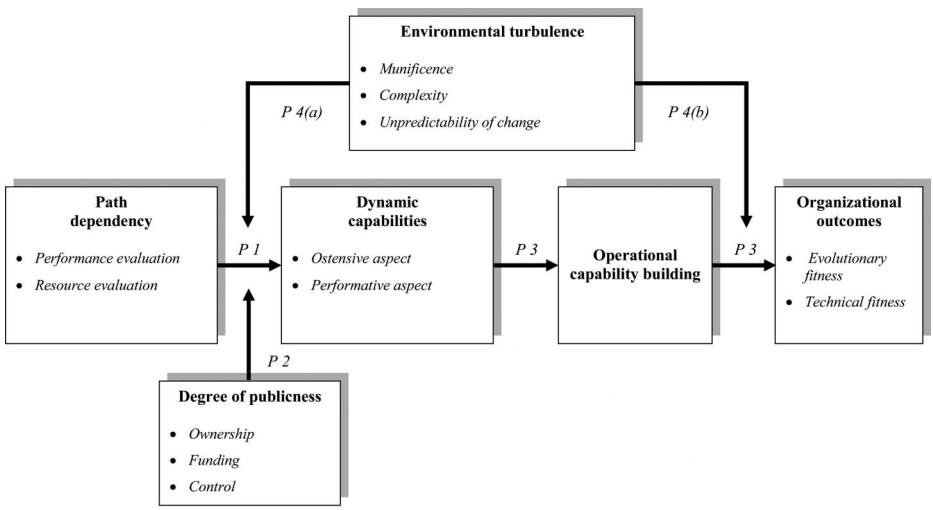

Figure 1: Dynamic capabilities in public organizations – an analytical model

from different internal (e.g. performance management systems) and external sources (e.g. regulatory authorities). In PSOs, change is often externally rather than internally triggered as, for example, the failure to meet the standards and goals of external stakeholders such as governments or oversight bodies can provoke penalties or interventions (Salge, 2011). Yet, evidence suggests that while internal dissatisfaction with the status quo provides a strong impetus for using dynamic capabilities in order to achieve far-reaching organizational transformation, externally induced change has been shown to result in half-hearted change efforts (Piening, 2011). This finding is reflective of the broader debate on whether the primary objective of many change activities in PSOs is actually better substantive performance or rather greater legitimacy by conforming to the expectations of their political stakeholders (Ashworth *et al.*, 2009; Frumkin and Galaskiewicz, 2004). Instead, the perceived need to change has to outweigh inertial forces within organizations such as micropolitics (Nelson and Winter, 1982) and self-reinforcing dynamics (Schreyögg and Kliesch-Eberl, 2007; Zahra *et al.*, 2006). Similarly, Fernandez and Rainey (2006) conclude that the implementation of planned change in PSOs requires that managers verify the need for change to convince other organizational members as well as external stakeholders.

Moreover, research highlights the importance of *resource evaluation* processes. Evidence suggests that the managements' perception of its scope for action with respect to the available resources influences the intensity of innovation efforts, i.e. how PSOs deploy dynamic capabilities (Piening, 2011; Ridder *et al.*, 2007). As change is costly, public organizations with high levels of slack are more likely to engage in search and problem-solving activities following performance decline (Salge, 2011). The level of uncommitted resources increases the likelihood that decision makers perceive organizational performance crises as controllable (Kelman, 2006). In sum,

> **Proposition 1:** *When sufficient resources are available, dissatisfaction with existing operational capabilities increases the likelihood that public organizations develop and deploy dynamic capabilities.*[3]

Second, there is evidence that the *degree of publicness* might be a moderating influence on the creation and subsequent use of dynamic capabilities in PSOs. The extent to which an organization is public or private depends on its level of collective ownership, level of state funding, and the degree to which managers are controlled by political forces (Andrews *et al.*, 2011; Bozeman, 1987). In general, it is assumed that a higher degree of publicness is associated with strategic constraints and innovation barriers as, for example, greater political influence and the absence of market incentives discourage organizations from risk-taking (Andrews *et al.*, 2011; Nutt and Backoff, 1993; Rainey, 1999). Research by Mone *et al.* (1998) suggests that the degree of publicness may influence organizations' responses to performance crises. They argue that compared to private firms, public organizations are less likely to enter new strategic domains or alter the way they serve existing customers or constituents following performance decline. Accordingly, PSOs lack flexibility in improving their performance because the set of

activities that is permissible in terms of their mission is defined more narrowly, with deviance from their stakeholder's expectations threatening their legitimacy. In support for this interpretation, Jas and Skelcher (2005) found that when and how local authorities respond to performance problems depends on factors such as political interests and public opinion. Likewise, a high degree of publicness may discourage PSOs from making long-term investments in dynamic capabilities as indicated by the differences between public and private organizations with respect to the nature of their dynamic capabilities. For example, while dynamic capabilities in private firms are often based on institutionalized learning mechanisms such as R&D (e.g. Eisenhardt and Martin, 2000; Teece, 2007), change activities in the public sector are rather embedded into the day-to-day operations of PSOs. Instead of generating innovations in specialized R&D departments which require substantial financial resources, public organizations often use ad-hoc project teams with part-time team members to adopt externally developed innovations (Gilmore and Krantz, 1991; Piening, 2011; Rashman *et al.*, 2009). In contrast, Winter (2003) argues that in the for-profit sector dynamic capabilities generally involve a lot of specialized personnel who are committed full time to their change roles. Accordingly, it is assumed that developing and using dynamic capabilities requires high levels of time and energy from committed managers (Pablo *et al.,* 2007). In organizations with a high degree of publicness, limited managerial autonomy and incentives to improve performance might discourage managers from making such commitments (e.g. Piening, 2011). Thus,

Proposition 2: *The higher the degree of publicness, the less likely are public organizations to develop and deploy dynamic capabilities.*

Moreover, the model is based on the premise that dynamic capabilities influence organizational outcomes indirectly via their impact on operational capabilities, i.e. guide the collective learning process of capability building (Helfat *et al.*, 2007; Pavlou and El Sawy, 2011; Zahra *et al.*, 2006; Zollo and Winter, 2002). Research in different public sector settings corroborates this view (Jones *et al.*, 2005; Piening, 2011; Ridder *et al.*, 2007). Planned organizational change necessarily involves the development of new operational capabilities as, for example, the adoption of a new technology or work practice disrupts existing routines (Edmondson *et al.*, 2001). Whether PSOs are able to perform this task effectively has been shown to depend on both the quality of their routines for the coordination of activities, internal communication and managing external stakeholder relationships, employee training, and knowledge codification (e.g. Easterby-Smith *et al.*, 2008; Guimarães *et al.*, 2011; Vera and Crossan, 2005) as well as the way these routines are invoked (Piening, 2011; Ridder *et al.*, 2007). This observation is in line with the idea that dynamic capabilities encompass an *ostensive* and a *performative aspect* (Ambrosini and Bowman, 2009). While PSOs certainly exhibit some commonalities with respect to the structure of dynamic capabilities, differences in their

ability to change might ultimately stem from how extensively and appropriately public managers' use established dynamic capabilities.

Again, dynamic capabilities do not necessarily engender superior performance. Instead, the measures *evolutionary* and *technical fitness* provide yardsticks to evaluate their performance effects. On the one hand, evolutionary fitness expresses how well a capability enables a firm to make a living. Evolutionary fitness references the selection environment, i.e. captures how well the resulting operational capabilities match the requirements of the particular context in which an organization operates. On the other hand, technical fitness refers to how efficiently a capability (operational or dynamic) performs its function. This measure recognizes the costs of capability building (Helfat *et al.*, 2007; Martin, 2011; Teece, 2007). In essence, these measures are comparable to the common distinction between effectiveness and efficiency. While effectiveness describes the organizations' achievement of its respective goals such as the creation of public value or accountability, efficiency refers to rates of resource usage in achieving these objectives, i.e. the ratio of outcomes to inputs (Behn, 2003). With respect to the multidimensionality of the performance construct, defining and measuring performance in PSOs necessarily involves a discussion of both effectiveness and efficiency (e.g. Selden and Sowa, 2004). Indeed, the reviewed studies demonstrate that dynamic capabilities in PSOs can contribute to organizational effectiveness in terms of revenues, self-income ratio, employment rate and medical quality (Carmeli and Tishler, 2004; Ridder *et al.*, 2007) as well as efficiency (e.g. hospital length of stay) (Piening, 2011). In sum,

> **Proposition 3:** *The deployment of dynamic capabilities is likely to be positively related to the evolutionary and technical fitness of public organizations via operational capability building.*

Finally, Figure 1 highlights the moderating influence of environmental turbulence on dynamic capabilities in PSOs. The majority of the work on dynamic capabilities asserts that they are particularly valuable in turbulent environments where technological, regulatory and competitive conditions change rapidly. Under such conditions, the ability to change and quickly develop new operational capabilities is seen as a critical prerequisite for long-term success (Aragón-Correa and Sharma, 2003; Zahra *et al.*, 2006; Zollo and Winter, 2002). Public sector organizations increasingly operate in such rapidly changing environments. Basically, environmental turbulence in the public sector can be seen as a function of three dimensions, namely munificence, complexity and uncertainty of change (e.g. Boyne and Meier, 2009). First, *munificence* refers to the availability of resources such as revenues from taxes and fees in a geographical region or public sector. Munificence is affected by the intensity of competition as well as political and social conditions. *Complexity* describes the homogeneity or heterogeneity of external circumstances which confront a public organization. The complexity increases, for example, when an organization provides services to heterogeneous clients with different needs. Finally, the degree of turbulence depends on the *unpredictability* rather than the

frequency of changes in the munificence and complexity of an organization's environment (Boyne and Meier, 2009; Hendrick, 2003).

However, the influence of environmental turbulence on dynamic capabilities is two-fold. On the one hand, it is seen as a contingency factor in the decision to deploy dynamic capabilities (Eisenhardt and Martin, 2000; Wang and Ahmed, 2007). Public managers are shown to be more likely to invest in dynamic capabilities when the organization is confronted with rapidly changing market demands or stakeholder expectations (Easterby-Smith *et al.*, 2008; Pablo *et al.*, 2007). Similarly, it has been argued that managers facing uncertain environments tend to be more proactive, take greater risks and use more innovative strategies than managers in less turbulent environments (Aragón-Correa and Sharma, 2003). Turbulent environments create a discrepancy between existing and ideal operational capabilities, thus providing incentives to overcome organizational path dependence (Pavlou and El Sawy, 2011). On the other hand, the level of environmental dynamism affects the potential gain from dynamic capabilities as the renewal of operational capabilities is more rewarding in high-velocity markets (Eisenhardt and Martin, 2000; Zahra *et al.*, 2006). As Winter (2003: 994) argues: 'If opportunities for competitively significant change are sparse enough or expensive enough to realize, then the added cost of dynamic capabilities will not be matched by corresponding benefits'. Moreover, as dynamic capabilities can be expected to be more often used in dynamic markets organizations operating in such environments are more likely to realize learning curve effects. The notion of the learning curve implies that there is a positive correlation between the frequency of use of dynamic capabilities on the one hand and the quality and costs of their use on the other hand (Zahra *et al.*, 2006). Therefore,

> **Proposition 4**: *The higher the environmental turbulence, the higher the likelihood that public organizations (a) invest in dynamic capabilities and (b) benefit from having dynamic capabilities.*

In sum, the proposed model provides a framework for understanding how dynamic capabilities operate in public organizations and affect their performance outcomes.

CONCLUSIONS AND IMPLICATIONS FOR FUTURE RESEARCH

The aim of this article was to present a review as well as a synthesis of the extant literature on dynamic capabilities in public organizations. This review article is timely, given the lack of theory-based research on public sector change and the fragmented nature of this field (e.g. Fernandez and Rainey, 2006; Ferlie *et al.*, 2003). Recognizing the value of the dynamic capability concept for the analysis of change-related issues in PSOs, the central contribution of this articlde lies in the development of an analytical model. Based on a set of testable propositions, this model sheds light on the relationships among variables central to dynamic capabilities, their antecedents, and

their outcomes in PSOs. In particular, the model reflects a routine-based perspective of dynamic capabilities because routines provide a lens for understanding how work is actually carried out in organizations (Becker and Zirpoli, 2008; Parmigiani and Howard-Grenville, 2011). On the one hand, routines are the mechanisms through which dynamic capabilities are put into use. On the other hand, dynamic capabilities operate on routines as their primary function is to develop or modify operational capabilities (Helfat *et al.*, 2007; Zollo and Winter, 2002). For researchers seeking to open the black box of how PSOs change and to understand differences in their performance, it is therefore essential to analyse the factors that shape the development and use of organizational routines.

Additional empirical research in the public sector realm is required to test the propositions developed in this article. For the most part, further research is needed to enrich our understanding of the specifics of dynamic capabilities in the public sector. For example, the influence of context-related variables such as the influence external stakeholders (e.g. governments) on the deployment of dynamic capabilities has yet to be systematically studied. In order to identify such moderating influences, a comparative study between public and private organizations' dynamic capabilities would be a promising approach. Future work on dynamic capabilities in PSOs can contribute to both the public management literature and the ongoing debate in strategic management research about the nature, functioning and explanatory value of dynamic capabilities. Since dynamic capabilities have been mainly studied in highly dynamic industries such as semiconductors or biotechnology, it is argued that research in other contexts, most notably the public sector, is necessary to provide a more comprehensive picture of these capabilities (Barreto, 2010; Easterby-Smith *et al.*, 2009).

Another important avenue for future research is to address the micro-process question of how and why managers use dynamic capabilities which needs further elaboration and empirical grounding (Ambrosini and Bowman, 2009; Pablo *et al.*, 2007; Salvato and Rerup, 2011). Likewise, the proposed model highlights the critical role of public managers as their perception has been shown to influence whether and how an organization invests in dynamic capabilities. In this regard, the distinction between the ostensive and performative aspect of dynamic capabilities provides a useful starting point to address the role of agency in performing dynamic capabilities. However, given the limited scope of this review further theoretical development is clearly needed to deepen our understanding of dynamic capabilities in practice. Research in this area would benefit from multilevel theorizing which links the organizational and individual level components of dynamic capabilities (Salvato and Rerup, 2011). This entails, for example, that future literature reviews might go beyond the organizational-level focus of this article and include studies adopting an individual-level practice perspective (see e.g. Ambrosini and Bowman, 2009).

A central practical implication is that dynamic capabilities can not be bought in markets but have to be built internally by the organization through experience accumulation (Teece *et al.*, 1997). Public managers can foster the development of

dynamic capabilities by allocating resources to search and learning activities (e.g. building databases) or by encouraging employees to share their knowledge (Makadok, 2001; Zollo and Winter, 2002). Yet, it has to be noted that there are many ways to change. While dynamic capabilities are certainly a central mechanism through which organizations change, there are also others such as ad hoc problem solving or simply luck (Winter, 2003). Since the reliance on ad hoc problem-solving is one reason why many PSOs struggle to implement change (Gilmore and Krantz, 1991), investments in dynamic capabilities as regular, more reliable problem-solving patterns can be seen as an important means to enhance the change capacity of PSOs. Another argument in favour of dynamic capabilities concerns the high turnover among public managers which has been identified as a major obstacle to the implementation of innovations in PSOs (see Rainey, 1999; McCabe *et al.,* 2008). Although dynamic capabilities are executed by individual organizational members, they nonetheless represent supra-individual repositories of organizations' problem-solving knowledge. The knowledge embedded in the routines of dynamic capabilities is accessible to other organizational members, regardless of whether individual employees leave the organization (e.g. Nelson and Winter, 1982).

Finally, the methodological implication of this review is that public management research should continue to use in-depth qualitative data to delve into the microfoundations of dynamic capabilities (Ambrosini and Bowman, 2009). In order to better understand how dynamic capabilities shape the performance of PSOs, combining qualitative and quantitative methods, e.g. to link qualitative process data with quantitative outcome data, seems to be a particularly promising approach (Ferlie *et al*., 2003). Moreover, existing research on the performance effects of dynamic capabilities in PSOs is based on single performance indicators such as hospital length of stay. Instead, future research might employ multidimensional performance measures that simultaneously capture the contribution of dynamic capabilities to organizational effectiveness and efficiency.

NOTES

1 In focusing on the acquisition of external knowledge as an important mechanism underlying capability renewal, the dynamic capability approach shares some common features with the absorptive capacity concept. Absorptive capacity is defined as a firm's ability 'to recognize the value of new, external information, assimilate it and apply it to commercial end' (Cohen and Levinthal, 1990: 128). This ability is largely a function of a firm's level of prior related knowledge. Building on the dynamic capability literature, Zahra and George (2002) extend Cohen and Levinthal's (1990) original conceptualization of absorptive capacity towards a more process-oriented interpretation. They view absorptive capacity as a dynamic capability which is embedded in different interrelated routines (see also Harvey *et al*., 2010). On the other hand, absorptive capacity research has influenced theorizing on dynamic capabilities. For example, Wang and Ahmed (2007) conceptualize absorptive capacity as a sub-dimension of the broader concept of dynamic capabilities.

2 It should be noted that the terms organizational competencies and capabilities are generally used interchangeably in the literature. Like capabilities, competencies build on organizational routines and refer to

the firms' ability to perform an activity such as product development (which is, for example, based on technological and customer competencies) or firm acquisitions by using a set of input resources (Danneels, 2002; Dosi *et al.*, 2008). A competence is labelled as 'distinctive', when it is difficult for others to replicate and enables an organization to perform a function (e.g. marketing, human resource management) in a manner superior to that of its competitors (e.g. Hitt and Ireland 1986).

3 It should be noted that there is necessarily a certain degree of overlap between the development and deployment of dynamic capabilities. The notion of dynamic capabilities as being bundles of organizational routines implies that they are 'the outcome of trial and error learning and the selection and retention of prior behaviours' (Gavetti and Levinthal, 2000). In this respect, Zollo and Winter (2002) emphasize that the initial development of a dynamic capability is not solely based on quasi-automatic experience accumulation but also involves more deliberate cognitive processes such as management's decisions to invest in knowledge articulation and codification activities. Likewise, the subsequent use of dynamic capabilities is influenced by individual behaviour, cognition, and emotion (see Ambrosini and Bowman, 2009). Over time, varying individual performances of the underlying routines can alter the nature or structure of a dynamic capability (ostensive aspect) (see Feldman and Pentland, 2003). From a practice perspective, dynamic capabilities can be even portrayed as emergent, i.e. they come about only through being performed by actors (Parmigiani and Howard-Grenville, 2011). I would like to thank one of the anonymous reviewers for mentioning this important point.

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