Efficiency creep and shadow innovation: enacting ambidextrous IT Governance in the public sector

Johan Magnusson, Dina Koutsikouri & Tero Päivärinta

Published online: 15 Apr 2020.

Submit your article to this journal ⧉

View related articles ⧉

View Crossmark data ⧉

THE OPERATIONAL RESEARCH SOCIETY

Taylor & Francis
Taylor & Francis Group

EMPIRICAL RESEARCH

OPEN ACCESS

Check for updates

Efficiency creep and shadow innovation: enacting ambidextrous IT Governance in the public sector

Johan Magnusson[a,b], Dina Koutsikouri[a] and Tero Päivärinta[c,d]

[a]Swedish Center for Digital Innovation, University of Gothenburg, Gothenburg, Sweden; [b]Kristiania University College, Oslo, Norway; [c]M3S Research Group, University of Oulu, Finland, Sweden; [d]Information Systems, Luleå University of Technology, Sweden

ABSTRACT

The current push towards increased innovation within the public sector calls for new approaches to IT Governance. However, recent findings highlight the aim to avoid trade-offs between innovation and efficiency through organisational ambidexterity. This paper reports a case study of ambidextrous IT Governance in two large government agencies. According to the findings, ambidextrous IT Governance is enacted through two separate but interrelated mechanisms that emerge simultaneously. In terms of exploitation, the "efficiency creep" mechanism creates a bias for efficiency – rather than innovation-oriented investments. In terms of exploration, the "shadow innovation" mechanism involves unsanctioned innovation activities. These two mechanisms interplay, in the enactment of ambidextrous IT Governance. The contribution of this study lies in theorising about how ambidextrous IT Governance is enacted in public sector organisations, and how efficiency creep and shadow innovation influence each other. This contribution aids future research and practice on public sector innovation and IT Governance.

1. Introduction

Within the public sector, digitalisation ushers in a new era of government, which replaces New Public Management (NPM) as the core logic (Osborne, 2006). While NPM imported ideas from the private sector designed to be instrumental in the quest for ever greater efficiency, digital government (Janowski, 2015; Tassabehji et al., 2016) places innovation at the core, e.g., through such emerging concepts as "Government 2.0" or even "3.0" (Yli-Huumo et al., 2018). Innovation becomes instrumental for sustaining the relevance and legitimacy of government over time (Dawson et al., 2016; Trong Tuan, 2017; World Government Summit & OECD, 2017). Therefore, innovation complements other sources of government legitimacy such as compliance with laws and regulations, equal treatment in the eyes of the law, and accountability. The argument behind this assumption is that with increased rates of change in the government's environment, stable structures, and economies of scale will be insufficient to secure future relevance and legitimacy. Hence, agility (Mergel, 2016; Mergel et al., 2018) and adaptability (Janssen & Van der Voort, 2016) become new core capabilities for public sector organisations meeting constant pressures to change. At the same time, there is a reported lack of research examining how digital innovation is governed (Cram et al., 2016; Nambisan et al., 2017; Svahn et al., 2017).

The foundational literature on organisational studies has identified a trade-off between innovation versus efficiency (Benner & Tushman, 2003; Merton, 1958; Stettner & Lavie, 2014; Stigler, 1939). Below, we use these two concepts by adhering to the definitions by Benner and Tushman (2003) and Xue et al. (2012). *Efficiency* represents a focus on incremental improvements in existing services and processes, building upon existing technologies (Xue et al., 2012, p. 510), while *innovation* refers to radical initiatives and processes involving the acquisition and development of new organisational knowledge, skill sets, and service concepts (Benner & Tushman, 2003; Xue et al., 2012). Numerous attempts have been made to falsify the identified trade-off (Adler et al., 1999; Luger et al., 2018; MacDuffie, 1997), and recent research posits the importance of replacing the either/or thinking of innovation vs. efficiency with both/and thinking.

The concept of organisational ambidexterity suggests that successful organisations need to exploit existing opportunities to achieve efficiency, while simultaneously exploring new opportunities to achieve innovation (Benner & Tushman, 2003; Chi et al., 2017; Duncan, 1976; Raisch & Birkinshaw, 2008). Ambidexterity thus involves two types of activities: exploitation and exploration (March, 1991). When the focus resides in efficiency, the related improvement activities are exploitative, whereas innovation requires exploratory activities (Benner & Tushman, 2003; Xue et al., 2012). In line with Xue et al. (2012), we use the concept of innovation in this paper to refer to initiatives and processes that require exploratory activities.

Despite the extensive body of ambidexterity research, relatively few empirical studies adopting this theoretical lens have been conducted in the public sector context (see Choi & Chandler, 2015; Fossestøl et al., 2015; Smith & Umans, 2015; Trong Tuan, 2017). The public sector thus remains largely locked in a predominant focus on efficiency. To exemplify this, TBMV (2016) illustrates state-of-the-art IT investments in US federal spending (2010–2017), which show a continuous decrease in innovation-focused investments coupled with a continuous increase in efficiency-focused investments. We argue this development is counter-intuitive based on the identified need for increased innovation, and that it is the result of IT Governance being designed according to the logic of NPM with a bias towards achieving efficiency. This bias has previously been identified by Xue et al. (2012) within the private sector and Salge et al. (2015) in their study of IT investments in hospitals and is considered the result of the whole-sale adoption of governance frameworks such as COBIT and ITIL being designed for a different setting than the present (Boonstra et al., 2017).

In this paper, we propose that public sector organisations, albeit tilted towards exploitation, are inherently able to simultaneously employ exploitation and exploration activities. The balancing point, i.e., the inherent mix of exploitation and exploration is, however, neither explicit nor formally controlled (Magnusson et al., 2017), and a lack of research addresses the actual enactment of ambidextrous IT Governance (Wiener et al., 2016). Our research thus addresses the following research question:

How do public sector organisations enact ambidextrous IT Governance?

Our research aims to answer the calls for research by Janssen and Van der Voort (2016) on ambidextrous mechanisms for adaptive governance, by Wiener et al. (2016) on additional research into the enactment of IS project control, and by Cram et al. (2016) on control mechanisms for innovation. Through perceiving the balancing of innovation and efficiency as an ambidextrous activity, this study aims to add empirical and theoretical insights to the field. In doing so, we follow the perspective of ambidexterity as dynamic rather than static (balancing rather than balance) as seen in

Luger et al. (2018) and Zimmermann et al. (2018). Our empirical observations are based on a case study of two large government agencies in Sweden conducted between 2016 and 2017.

The remainder of the paper is organised as follows: After theoretical framing and a review of related research, we present the method of the study. Then, the results identify and elaborate the core constructs through an analysis of the two organisations, leading to theorising about the ambidextrous mechanism and suggesting a dynamic relationship between the suggested concepts of efficiency creep and shadow innovation. This is followed by a discussion where we elaborate on the implications of our findings and offer directions for future research and implications for practice.

2. Theoretical framing

2.1. A short history of IT Governance: from adhocracy to ambidexterity

Over the years, a plethora of definitions and normative configurations of IT Governance have been proposed (Van Grembergen & De Haes, 2009; Weill & Ross, 2004), and reviews of related literature have been conducted (see Grabski et al., 2011). However, historical accounts of how IT Governance has changed over the years remain rare. We argue that a sound understanding of the current enactment of IT Governance requires a revisiting. Based on a combination of studies from the public and private sectors, the history of IT Governance can be roughly divided into three distinct waves of transformation (Figure 1). The rationale for not focusing solely on the public sector's evolution of IT Governance lies in the reported high level of isomorphism within IT Governance practice (Magnusson, 2010), where private sector ideas are indiscriminately imported into the public sector context.

The first wave of IT Governance transformation (in the 1980–90s) involved a shift away from IT investments being autonomous and highly decentralised and governed by what could be perceived as adhocracy (Mintzberg & McHugh, 1985). The rationale for this shift was the development in technological design
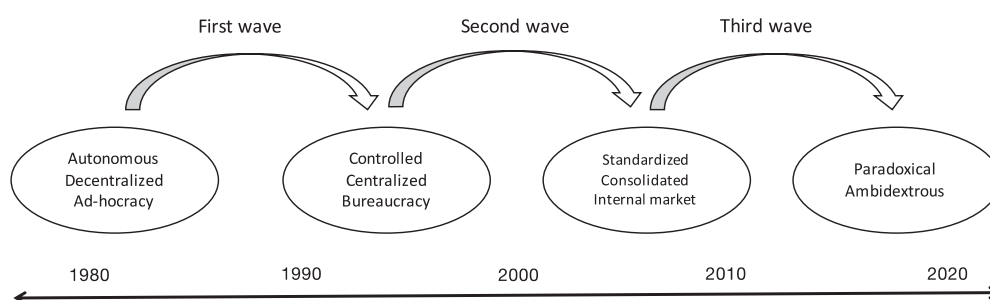

Figure 1. Three waves of IT Governance transformation in the public sector.

where desktop computing became diffused in the workplace, along with a market for software designed for more niched solutions than the previous architecture dominated by mainframe systems (Magnusson & Nilsson, 2015).

As a consequence, organisations were faced with substantial redundancies and associated risk, which required governance. Coupled with a shift in technology towards a novel dominant architecture (client-server), new avenues for centralised solutions such as Enterprise Resource planning (ERP) systems were regarded as feasible and instrumental in alleviating the drawbacks of the previous era. The effect was formalisation of IT Governance and a shift in the locus of control away from the siloed departments towards the central management (Weill & Ross, 2004). The formalisation served multiple purposes. On one side, it created the "ticket to ride" for IT departments in terms of pushing their agenda into the higher echelons of management, increasing the legitimacy of the IT department (Magnusson & Bygstad, 2013). On the other side, it created a situation where a previously proactive stance towards IT was replaced with a more reactive stance (King & Teo, 2000). This change is seen as a direct consequence of the size of the investments increasing in parallel with the scope of the investments, whereby the potential number of investments needed to be decreased.

The second wave of IT Governance transformation continued along the path of formalisation. New models for governing the IT department followed a strict supply-and-demand logic, where the interface between the organisation and the IT department was standardised into an internal procurement process (Chen et al., 2010). The delivery from the IT department was standardised into a service portfolio, under heavy influence from governance frameworks such as COBIT, ISO38500, and ITIL (Peterson, 2004). With a continued dominance of large-scale, capital intensive investments as the core element of IT, the aim was to continue to reduce complexity and risk in the internal supply of IT. Through assigning IT staff roles such as demand managers the idea was to delimit the fluctuation of demand towards the IT department and drive efficiency in delivery. This internal market perspective on "IT as a business" (Guillemette & Paré, 2012; Lutchen, 2011) led to a situation which amalgamated the reactive stance with a singular focus on efficiency, resulting in negative consequences for innovation and, new, previously unheard risks such as shadow IT and other forms of unsanctioned provisioning of IT (Myers et al., 2017).

The third (and current) wave of IT Governance transformation is signified by the organisational response towards the two former waves. With IT Governance predominantly geared towards achieving efficiency through diagnostic control (Simons, 1995), current mechanisms lack the necessary support for

facilitating innovation (Cram et al., 2016). Instead, innovation is pushed into the "shadow" of governance, i.e., it is in large part doomed to be unsanctioned and formally counteracted. The practical response towards this has been the introduction of "bimodal IT" (Haffke et al., 2017), which is the idea that the IT function needs to be able to handle two parallel modes of delivery. One is the traditional mode focused on efficiency, while the other is focused on innovation. This setup increases the need for an influx of ideas regarding adaptive governance (Janssen & Van der Voort, 2016), agility (Mergel, 2016; Mergel et al., 2018) and organisational ambidexterity (March, 1991).

As noted, bimodality is translated into dividing the IT function into two separate entities, where efficiency-geared IT is handled in a shared service centre configuration, and innovation-geared IT is handled through temporary entities in the form of "innovation hubs" (Youtie & Shapira, 2008). This type of structural separation or structural ambidexterity (Benner & Tushman, 2003; Birkinshaw et al., 2016; O'Reilly & Tushman, 2013; Raisch & Tushman, 2016; Tushman & O'Reilly, 1996) is advocated by industry analysts and consultancy firms as a path to the bimodal (Haffke et al., 2017) through increased proactivity (Xue et al., 2017). The structural ambidexterity brings new professional roles into play, where the chief digital officer, responsible for either the innovation hub or the overarching digitalisation agenda, is becoming increasingly popular in the public sector (Singh & Hess, 2017). At the same time, a singular focus on structural separation rather than alternatives such as temporal separation through punctuated equilibrium (Gregory et al., 2015; Romanelli & Tushman, 1994; Siggelkow & Levinthal, 2003) or contextual ambidexterity (Birkinshaw & Gibson, 2004; Gibson & Birkinshaw, 2004) runs the risk of overly simplifying the strive for ambidexterity in IT Governance.

The increased interest of the IT department to manage the paradoxical tensions (innovation vs. efficiency, standardisation vs. customisation etc.) inherent in IT thus becomes a signifier of the emerging enactment of IT Governance (Gregory et al., 2015). This view is consistent with research inspired by organisational ambidexterity (Benner & Tushman, 2003; Luger et al., 2018; March, 1991; Raisch & Birkinshaw, 2008), which challenge previous perceptions of trade-offs. In other words, achieving, e.g., efficiency and innovation simultaneously is both necessary and feasible to drive performance (Junni et al., 2013). Recent years have seen an influx of new findings associated with how this is possible through IT Governance redesign (Chi et al., 2017; Gregory et al., 2018, 2015; Mithas & Rust, 2016). Yet, critique still prevails that ambidexterity is studied in an overly acontextual, configuration-driven approach (Heracleous et al., 2019; Raisch & Birkinshaw, 2008; Simsek et al., 2009). Core to more recent contributions within the field of

organisational ambidexterity (Heracleous et al., 2019; Luger et al., 2018; Zimmermann et al., 2018) is the disbanding of a static perspective to ambidexterity (i.e., balance) towards a process-oriented perspective (i.e., balancing), studied through a focus on enactment.

2.2. The invariable quest for innovation in government

Innovation in government has been highlighted as increasingly paramount by research and practice alike (Dawson et al., 2016; Kankanhalli et al., 2017; OECD Ubaldi, Van Ooijen & Welby, 2019; World Economic Forum, 2016; World Government Summit & OECD, 2017). At the core is the perception of innovation as an activity involving the innovation and exploitation of the new, i.e., acombination of conception and implementation (Mulgan & Albury, 2003).

The rationale for an increased push towards innovation lies in the truism that the desired pace of change increases over time. In other words, the environment surrounding government is perceived as becoming more dynamic than before, and government needs to adapt. The pace of change is deemed to follow a logarithmic curve rather than being linear, and, with the logarithmic curve comes issues affecting plannability, i.e., how we assure that we can adequately assess future change to ultimately support successful policymaking (Archibugi, 2017).

In line with Xue et al. (2012) and the foundational literature on ambidexterity (Benner & Tushman, 2003; March, 1991; Raisch & Birkinshaw, 2008), we argue that in order to avoid potential hampering of the notion of innovation, a discriminatory definition is necessary. This definition needs to delimit innovation from continuous improvements and other incremental activities primarily geared towards efficiency. Returning to the work conducted by March (1991) and the distinction between the activities of exploration and exploitation, the concept of innovation in this paper includes only such initiatives and processes that require exploratory activities.

Using this definition, activities focused on increasing the efficiency of existing operations conceptually fall outside the realm of innovation since they are directed towards exploiting existing opportunities. A large portion of the initiatives currently undertaken within the realm of digitally enabled service transformation (Weerakkody et al., 2016) hence falls within the category of efficiency and opens for a new take on government digitalisation in general. The equation of digital transformation with innovation that is present within much of the previous research and practice is problematic since it makes the multi-faceted phenomenon of digitalisation laden with innovation connotations. Activities such as implementing a new standardised ERP system for increasing the efficiency in internal workflows is very much a part of digital transformation, but it is not necessarily an example of innovation (Kallinikos, 2010). Figure 2 juxtaposes the proposed conceptualisation against the traditional.

At the same time, the proposed definition is in conflict with perceptions of innovation by Schumpeter (1927) and his emphasis on any form of novelty as the hallmark of innovation. As noted by Hansén and Wakonen (1997), these types of definitions run the risk of equating any change with innovation, which may prove to be a sliding slope (see Crossan & Apaydin, 2010 for additional reflections on this). Meijer's (2015) theoretical work with establishing barriers to e-governance innovation illustrates the perils of equating change by introducing new technology into the public realm with innovation. With a definition of "e-governance" that is technology-focused and laden with innovation, "e-government innovation" becomes a tautology.

The risks involved with including all digital initiatives into a category of innovation are two-fold. First, the tautological definition runs the risk of significantly affecting the construct validity of studies touching on the issue of digitalisation negatively. Second, if the increased call for innovation within government is warranted, then the possibility of equating everything digital with innovation creates a situation where the digital investments of government organisations are deemed as innovation capabilities regardless of whether they explore new opportunities or not. The risk here is that a substantial amount of the resources will be deployed for low-risk investments that can be motivated through increased leanness and cost-

TRADITIONAL CONCEPTUALIZATION

PROPOSED CONCEPTUALIZATION

Efficiency   Innovation
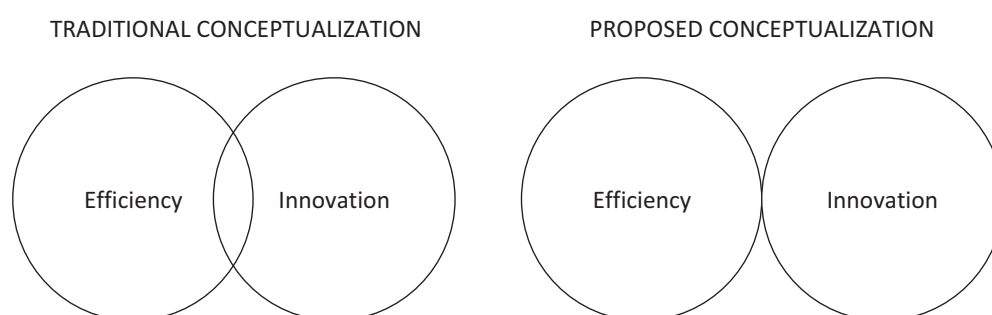
Efficiency   Innovation

Figure 2. Shift in conceptualisation of the differentiation between efficiency and innovation.

cutting. As seen in previous research (Mithas & Rust, 2016), a single strategy is not enough to achieve long-term success, whereby this behaviour may prove detrimental for future success.

We argue that adherence to the proposed conceptualisation of innovation as separate from efficiency opens for a more constructive and feasible study of government innovation. Previous research has highlighted that innovation activities are endowed with a high degree of risk and uncertainty, i.e., closely related to experimental activities (Cram et al., 2016; Nambisan et al., 2017). From this perspective, the proposed definition of innovation pushes it to becoming the very negation of efficiency itself. In other words, innovation is by definition *in*efficient since exploration is associated with a high degree of uncertainty and risk. Based on this logic, organisational slack becomes a vestige of innovation rather than an operational deficiency.

Previous research has touched upon innovation activities that happen in the shadows of control. In their study of innovation within the aviation manufacturer Lockheed Martin, Miller (1995) and later Rich and Janos (2013) used the term "skunk works" to describe the often-times highly valuable grass-root emergence of unsanctioned innovation. Despite being seen as a pre-requisite for market success, the isolated nature of skunk work-based product innovation creates problems with scaling the subsequent innovation (Gwynne, 1997). From the perspective of increased digitalisation and the increased necessity for rapid scaling (Huang et al., 2017), the isolated nature of skunk work initiatives becomes problematic. At the same time, the inherent lack of formal governance configurations for innovation (Cram et al., 2016) sentences innovation activities to the shadow of control.

3. Method

We adopted a case study approach (Eisenhardt, 1989) to explore ambidextrous IT governance within two of the largest public sector organisations in Sweden, the Swedish Tax Authority (STA) and the Social Insurance Agency (SIA). We wanted to collect rich evidence of how ambidextrous IT governance is enacted in settings at the forefront of public sector digitalisation. Another consideration for selecting the cases was that both target organisations stated to face challenges related to their ability to balance efficiency and innovation. In view of this, the STA case allowed us to explore and identify the phenomenon itself, while the SIA case enabled us to surface its dynamic mechanisms ("efficiency creep" and "shadow innovation"). The sequence of the two case studies was based on the sheer timing of the co-operative project arrangements between the researchers and case organisations providing clear methodological advantages

for theory development (Eisenhardt, 1989). The variation presented in the different but interrelated public organisations provided a broader basis for illustrating how efficiency creep and shadow innovation interplay. Below, the research process in the target organisations is described in more detail.

3.1. Case 1: the Swedish Tax Authority (STA)

The STA has 10,000 employees with an annual budget of €200 million in 2017 (www.skatteverket.se). The IT department involves 800 employees. We considered the STA case revelatory since it could provide us with relevant insights into ambidextrous IT Governance in an empirically new setting. First, the STA is internationally acknowledged for having contributed to Sweden's best-in-class taxation system, resulting in a broad use of digital services and acceptance from the population to paying taxes. Second, the STA has historically been instrumental in accelerating the digital transformation of government in Sweden. With a high degree of independence from the state, the government pushes no technological standards centrally. In this context, the STA has pushed for national technical standards in the roles of the developer and the primary adopter. Third, the STA represents an example of an organisation in the third wave of IT Governance evolution (cf. the theoretical framing above).

Our entry to the STA started in spring 2016. Representatives of the STA board had expressed concern that the current level of innovation in the agency was sub-optimal, and as a result, they felt falling short of the potential benefits of digital transformation. To address this issue, they invited us to analyse the situation to determine "what is going on" and identify potential issues of improvement in IT Governance. After three initial workshops, the research group presented a project proposal that the agency accepted. The main objective was to investigate the enactment of ambidextrous IT Governance, which focused particularly on the underlying assumptions in the existing governance, and the balancing of innovation and efficiency in both governance and operations suggested by the organisational ambidexterity literature. The case study was conducted between fall 2016 and spring 2017 and was finalised through a written report and two executive briefings to the board.

3.2. Case 2: the Social Insurance Agency (SIA)

The SIA of Sweden employs 14,000 and has an IT department of 900 employees, with an annual budget of €160 million in 2017 (www.försäkringskassan.se). The rationale for the separate study on IT Governance enactment at the SIA was to gain insight into the existing practices surrounding IT Governance and its

Table 1. Overview of data collection from Case 1.

Focus	Data source	Description	Amount
Problem	Workshops	Workshops (1 hour each) with key representatives from the STA and the research team focused on discussing and defining the research agenda.	4
	Correspondence	Emails between the research team and representatives from the STA pertaining to the focus of the study.	150
Strategic	IT Governance Steering documents	Formal documents detailing the current configuration of IT Governance at the STA.	21
	Consultancy reports	Reports created by external parties to the STA with recommendations for how to improve IT Governance.	9
Tactical	Financial reports	Accumulated yearly (2016) figures with total spend, budgets etc. for each project.	4
	Project charters	Formal documents focused on describing and defining development and maintenance projects' scope, stakeholders, team, and objectives.	103
Operative	Survey	Activity-based costing inspired survey directed towards project managers.	22 of 54

effect on the organisational ambidexterity of the agency. After two initial meetings in spring 2017, we presented a project plan involving support in terms of quality assurance for the digital agenda and a request to conduct a separate case study to investigate ambidextrous IT Governance enactment. From the viewpoint of this research, the goal of the SIA case was to ascertain whether our initial findings in the first case of STA were relevant in another highly comparable and prominent context of a Swedish public agency. The aim was thus to increase the external validity of our preliminary observations at the STA through replicating beyond a single case and to deepen our understanding of the emergent concepts. The case study at SIA was conducted in 2017 and finalised through a written report on the current state of the art of ambidextrous IT Governance in the agency in 2018, and a development board briefing in 2019. The two case studies altogether provided us with a rare opportunity to study ambidextrous IT governance enactment in large public agencies.

3.3. Data collection

3.3.1. Case 1: the STA

The first author collected the data for the STA case over a 12-month period (spring 2016–spring 2017). The data sources included a series of workshops, secondary material in the form of IT Governance steering documents, consultancy reports, financial reports, and project charters, and continuous email communications between the research group and a representative from the STA (Table 1). The rationale for this selection of

secondary material was to gain a broad insight into the history (seen in the consultancy reports) and current practice (as seen in the steering documents, project charters, budgets, and survey) surrounding ambidextrous IT Governance enactment.

3.3.2. Case 2: the SIA

The second author carried out the data collection for the SIA case over an eight-month period (May–December 2017), including semi-structured interviews, meetings, a workshop, and a collection of secondary material including steering documents, consulting reports, financial reports, and project charters of the development portfolio (inspired by the first case study, see Table 2). The project charters served to confirm and disconfirm interpretations we made throughout the data analysis process, giving us a plentiful of qualitative indications (to be also reflected further by the interview data) to confirm that SIA found, indeed, itself in a similar situation as STA. The SIA regarded the overall quantitative analysis of the project charters (in style of the STA case) as unnecessary in this project, however.

Altogether, we conducted 13 semi-structured individual interviews with the members of the organisation (see Table 3 for further details). The interviews ranged from approximately 60 to 90 minutes, with an average of 70 minutes. All interviews were digitally recorded and transcribed. The informant selection focused on their particular roles and experience in managing development and innovation-related activities. To gather information of the core concepts identified in the STA case, efficiency creep and shadow

Table 2. Overview of data collection from Case 2.

Data source	Description	Amount
Meetings	Introductory meetings	2
Workshops	Workshops	1
IT Governance Steering documents	Formal documents detailing the current configuration of IT Governance at the SIA.	7
Consulting reports	Consulting reports directed towards IT Governance oversight and re-design.	9
Financial reports	Accumulated yearly (2017) figures with total spend, budgets etc. for each project.	3
Project charters	Formal documents focused on describing and defining development and maintenance projects' scope, stakeholders, team, and objectives.	96
Interviews	1–2 hours each with individuals (see Table 3) involved in project portfolio management, general IT Governance, and project management.	13

Table 3. List of respondents for interviews.

Respondents	Title	Function
1	chief architect	IT
2	innovation hub manager	IT
3	project leader	health insurance
4	project leader	Disability
5	development strategist/portfolio manager	Family
6	development strategist/portfolio manager	Migration
7	line manager	business support
8	line manager	line support
9	department head	CEO support
10	business developer	development staff
11	business developer	development staff
12	business developer	development staff
13	Controller	development staff

innovation, we posed questions on existing innovation processes and corresponding actors' perspectives on what influences each initiative (e.g., initiation, importance, and role of incentives for engaging in innovation activities). We also included questions aimed at gathering data on the overall properties of how innovation is governed (e.g., modes for prioritisation of investments, differences in the justification or lobbying activities related to whether innovation investments are geared towards efficiency or innovation). Finally, questions on the general attitude towards control and innovation capability and typical barriers in the innovation processes were included. The interviews took place at the SIA's headquarters in Stockholm. Consent for utilising the interviews in the study was granted by all informants at the end of each interview.

3.4. Data analysis

3.4.1. Case 1: the STA

We applied an analytic lens broadly based on Anthony's (1965) three layers of management control (strategic, tactical, and operative), which are based on a differentiation of temporality and locus of decision-making. The strategic layer concerns issues handled by senior executives, with an impact on the long-term directions of the entire organisation, such as corporate strategies and vision- and mission-statements (governance design). The tactical layer concerns middle-management decisions, such as prioritisation of investments (portfolio management), and the operative layer concerns short-term or immediate decisions made by managers and supervisors (project management).

First, we analysed the strategic layer through a content analysis of steering documents associated with IT Governance. Utilising the discriminatory definition of efficiency vs. innovation as presented in the Theoretical Framing, we performed a word count analysis utilising keywords and signifiers for efficiency and innovation. In regard to efficiency, terms such as "cost efficiency" and "efficient" were utilised, and in regard to

innovation, terms such as "dynamic," "innovation," "innovative," and "new development" were used building on March's (1991, p. 71) proposed operationalisations. Following the word count analysis, we calculated the balance between innovation and efficiency as a relative percentage. All steering documents included in the analysis were considered credible because they were selected by the informants. A similar content analysis approach has previously been used by researchers such as Uotila et al. (2009) in their study of S&P 500 corporation's financial performance and its relationship with ambidextrous balance.

Second, we analysed the tactical layer using financial budgets for 2016 and project charters of all major projects that constituted roughly two-thirds of the total IT spend in the organisation. Based on the project charters, the first author coded the objectives of each project into efficiency or innovation following the discriminatory definition. Based on this, the distribution of objectives was reinterpreted through financial data obtained from the budgets to arrive at a budgeted cost distribution for each project in terms of efficiency versus innovation. In other words, each objective as specified in the project charter was seen as either innovation or efficiency, and the total balance in monetary terms was calculated through taking the total budget (i.e., planned spend) for the project, and indiscriminately dividing it with the number of objectives. The underlying assumption that all objectives are equally resource-intense is problematic, yet we argue that it provides a sufficient proxy of ambidextrous balance. The alternative of trying to chisel out the expected budget going in to achieving each objective was deemed as impossible, given the integrative nature of activities necessary to achieve the objectives. With the lion share of objectives found to be efficiency oriented, we argue that this simplification is less problematic than if there would have been a more even distribution between efficiency/innovation-oriented objectives. The result was a calculation of the balance between innovation and efficiency in financial terms (complete budget)

for each project, which was then aggregated to a relative percentage.

Third, we analysed the operative layer using a survey directed towards all project managers/owners of the selection of projects analysed in the tactical layer. The survey, which was inspired by activity-based management (see McNair et al., 2001 for an introduction on this method focused on identifying activities and costs), asked the respondents to distribute time (i.e., resources) spent on efficiency versus innovation activities in their respective project. The survey was distributed to 55 respondents, with a response rate of 41%. In terms of the response rate, we attribute it in part to the complexity involved in conducting an Activity Based Management (ABM) inspired survey. As noted by Askarany and Yazdifar (2007), the complexity of the method is a common source of decreased response-rates. At the same time, building on previous studies using ABM, Askarany and Yazdifar (2007) highlight that non-response bias does not significantly influence the findings, even with response-rates around 20%. The result of the survey was an additional calculation of the ambidextrous balance between efficiency and innovation as a relative percentage for each project that was then aggregated.

In the final step of the analysis, we compared the different balances in the strategic, tactical, and operative layers, exploring potential explanations for inconsistencies. This involves comparing data from content-, financial- and accounting analysis, and albeit aware of the potential limitations involved, we argue in line with Modell (2009) that such an approach to data triangulation is warranted. The results were also regarded as insightful in communication with the representatives of the STA.

3.4.2. Case 2: the SIA

In the SIA case, we started our analysis based on the two core concepts (efficiency creep and shadow innovation), which were proposed by the analysis of the STA case. Our first analysis to verify whether these core concepts were relevant also in this case indicated that all (13/13) informants had identified some aspects of efficiency creep at SIA, also elaborating on explanations for it. A majority of the informants also discussed shadow innovation at SIA (10/13), and related reasons leading to it. Even in interviews which involved no mentions about shadow innovation as such, the informants expressed reasons for absence

of innovation orientation within the official organisation (which we identified later on with the second-order themes autonomy, slack, and opportunity to explain shadow innovation).

In the subsequent analysis, we followed an iterative approach in which the data collection and data analysis influenced each other (Eisenhardt, 1989). As we progressed through the empirical analysis of the data, we reiteratively compared it with the two core constructs. The qualitative data analysis proceeded to understand these phenomena in more detail along with identification of explanatory first-order concepts or themes (cf. Van Maanen, 1979) shedding more light on the core concepts of efficiency creep and shadow innovation. We also tried to stay as context-sensitive as possible to detect similarities and differences in relation with the STA case. To ensure that we could be confident in sorting interviewee accounts to either efficiency creep or shadow innovation, we assessed each other's codes and the quotations of the source data interpreted to represent the code and discussed potentially unclear codes of the first-order themes. Examples of such first-order themes (related directly to particular coding within each interview transcript and interpreted to lead towards or describe efficiency creep) were "risk avoidance", "lack of budget", "solution orientation", "focusing on core assignments", to name a few. Concerning shadow innovation, first-order themes such as "guerilla-activities", "immediate testing", "by-passing established routines", and "inter-organizational collaboration" were interpreted to describe or explain it. As we combined our separate coding efforts, we were able to infer and combine second-order themes from the first-order themes (Van Maanen, 1979) related to both efficiency creep (short-term focus, risk aversion, and loan funding) and shadow innovation (autonomy, slack, and opportunity).

We selected these six second-order themes for subsequent theorising as we identified them with a clearly greater number of interviews than the other candidates for the second-order themes. For example, the least common second-order theme among the selected ones, "loan funding" (explaining efficiency creep), was identified still with seven interviews out of 13 (Table 4), while we left out some other themes from our list of the most important themes (e.g., "power balance" between IT and line organisations), if these were mentioned only in one or two interviews. Rather, we regarded the more rarely emerging themes as potential background explanations by our informants, enriching many-sided

Table 4. Number of interviews with qualitative evidence of the two core constructs and six second- order themes (Legend: EC = Efficiency creep, ST = Short-term focus, RA = Risk aversion, LF = Loan funding, SI = Shadow innovation, AU = Autonomy, SL = Slack, OP = Opportunity).

	EC	EC:ST	EC:RA	EC:LF	SI	SI:AU	SI: SL	SI:OP
#Interviews identified with … (n = 13)	13	8	13	7	10	10	12	11

understanding of the six central second-order themes. For example, after discussions, we ended up to categorise mentions about "power balance" under the wider concept of autonomy, to explain such conditions for shadow innovation.

In the second stage, we met several times to discuss interpretations of our emerging understanding of the themes and identifying the six second-order themes as mechanisms enforcing them, compared notes, and discussed the theoretical implications. Through this analysis, we further developed our joint interpretation of the whole dynamics of ambidextrous IT Governance in which efficiency creep and shadow innovation were identified as two separate mechanisms interconnecting the ongoing processes of exploitation and exploration in the case settings.

Finally, based on the previous steps, we extended the analysis by looking for causal structures that generate observable events (Henfridsson and Bygstad, 2013), resulting in more detailed descriptions of the two mechanisms with help of the six second-order themes. At this stage, we identified potential explanations implying relations between the two core concepts from such interviews, which both had identified such mechanisms and provided informants' views on their potential relations. While anchored to the empirical data, the identified dynamics (i.e., the arrows) in our model between the two core concepts and between the second-order themes are based on slightly more interpretative reasoning of the researchers than the mere observation of the core categories and the six second-order themes *per se*.

Figures 4 and 5 in the results section illustrate our joint interpretation of the exploitation and exploration mechanisms.

4. Results

4.1. Identifying the core constructs: efficiency creep and shadow innovation

4.1.1. The case of the STA

We have a strong feeling that the level of innovation is significantly lower than what we would like it to be. (senior IT manager)

In the first case, we conducted a quantitative audit of the distribution of efficiency vs. innovation. All calculations used budgetary data from 2016 as provided by the informants, matching these figures against the content analysis (Strategic), the coding of the project goals (Tactical), and the distribution of resources (Operative).

As seen in Figure 3, the case displays a close to optimal fit between the strategic and the operative. This alignment of the factual (operative) with the intentions (strategic) is of particular interest given that the rationale for conducting the study is found in an expressed feeling that the organisation as a whole was down-prioritising innovation activities.

At the same time, the findings show that the substantial misalignment of the tactical vs. the strategic and operative layers could be a source of the expressed feeling of innovation sub-optimisation expressed in the above quote. The tactical layer consists of translating the strategic intent into the two portfolios
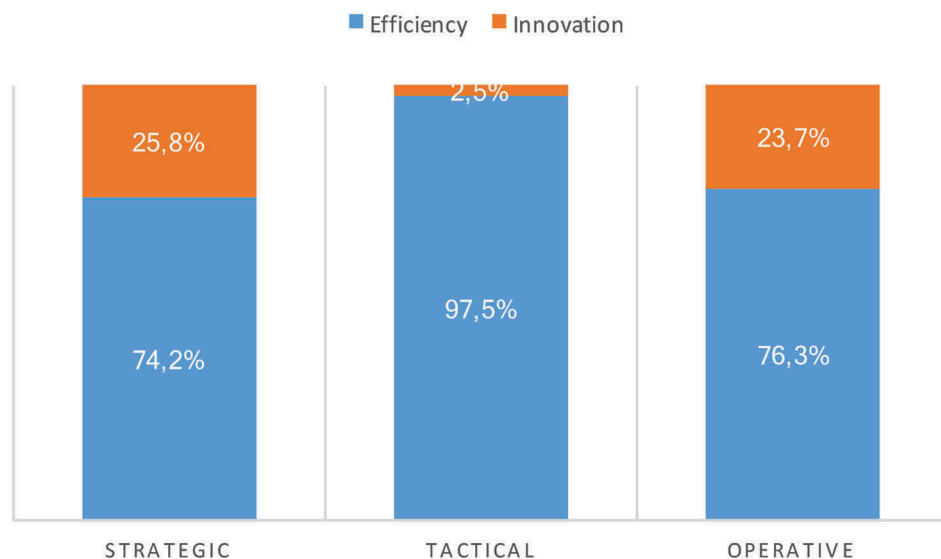

■ Efficiency ■ Innovation

	STRATEGIC	TACTICAL	OPERATIVE
Innovation	25,8%	2,5%	23,7%
Efficiency	74,2%	97,5%	76,3%

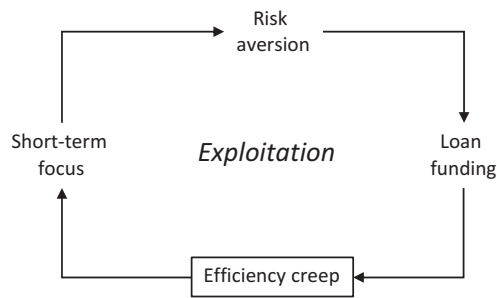**Figure 3.** Distribution of ambidextrous balance in three layers.

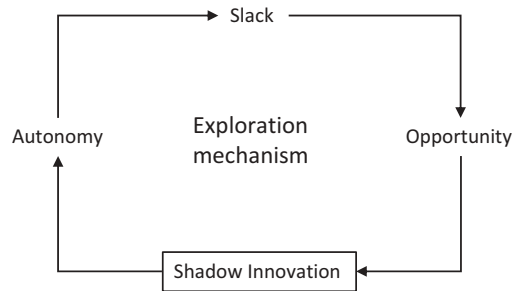**Figure 4.** The exploitation mechanism of efficiency creep.

Figure 5. The exploration mechanism of shadow innovation.

(maintenance and development) through portfolio management (standardised business cases and project charters) and the investment prioritisation process.

Examining the project charters in detail provided us with insights into why this layer displays such a different distribution than the other layers. A project was described as innovation oriented if it explored new possibilities of interacting with the citizens within areas that have previously not been addressed in the agency´s services, as illustrated by the following quote:

> We shall simplify and make the citizens submission of notices in regards to [omitted] more efficient and secure. (project charter, purpose)

Nevertheless, we found that in the majority of projects, innovation ideas were translated into a set of project goals that were focused on achieving efficiency gains rather than innovation gains (i.e., exploiting existing rather than exploring new opportunities) as illustrated in the following quote from the same project as the previous:

> Decrease the cost of [omitted] for the agency; shorten the work done by handlers, increase the quality in the register; increase the public's awareness of the tax authority's tasks. (project charter, effect goals)

The translation of innovation into efficiency indicates that the organisation as a whole displays a low understanding, or low appreciation, of the value of innovation. From the perspective of innovation as inefficiency due to increased risk and uncertainty, such a stance towards innovation is logical provided the NPM tradition within the agency. Increased risk

goes against the notion of lean and should be avoided and substituted by decreased risk. However, with the increased demand for innovation within government, the identified drift from innovation to efficiency (hereafter referred to as "efficiency creep") in the project charters and investment justification provides a structural hindrance for sanctioned innovation. Table 5 contains a selection of projects identified with similar patterns of efficiency creep.

Efficiency creep increases focus on efficiency rather than innovation in investment justification. Despite the original idea behind the investment being attributable to innovation, the measures tend to focus on efficiency metrics and objectives to assure the swift and/or possible justification and prioritisation.

The identified balance between innovation and efficiency in the operative layer was misaligned with the balance in the tactical layer. With more resources being spent on innovation than called for in the tactical layer, we identified this overemphasis (compared to the tactical) on innovation in the operative as "shadow innovation", i.e., unsanctioned spending on innovation. To reach a quantitative estimate of the extent of shadow innovation (i_s), we used the following formula,

$$i_s = (i_o - i_t) \times Budget$$

where i refers to innovation-oriented investment, and the subscript (t, o) refers to the level (tactical, operative) according to our classification based on Anthony (1958). We calculated the level of shadow innovation at the tax authorities to 21.2% of the total IT spending (measured through budget) by subtracting the amount of innovation spend within the tactical layer from the amount of innovation spend in the operative layer according to the above formula.

4.2. Exploring efficiency creep and shadow innovation and their interrelationship

4.2.1. The case of the SIA

In the SIA case, we explored the core constructs identified in the STA case. As declared above, we validated the existence of efficiency creep and shadow innovation at SIA first. Further on, we identified how these two mechanisms and the explanatory second-order concepts altogether constituted an ambidextrous IT governance mechanism of inter-related exploitation and exploration at SIA.

4.2.2. The exploitation mechanism: efficiency creep

The primary modus of prioritising an investment is associated with efficiency rather than innovation. In the business case that forms the basis for the group decision on investment prioritisation, there is an almost complete focus on efficiency gains as a means of justifying investments.

Table 5. Overview of purpose and goals of selected projects.

	Purpose	Goals
Project A	An improved, common, and automated workflow for [omitted].	Decreased manual labour correct and unified handling of [omitted] Improved monitoring Improved information quality Unified maintenance of process and system for [omitted]
Project B	To secure the future availability of IT for the tax authority and [omitted].	Efficient operations, maintenance and development 20% More cost efficient than compared to now Future-proof technical platform that will support the current and future needs of the organisation Secured availability through migration
Project C	Develop and launch ICT and method support … for [omitted] firms.	More efficient in the control of taxi firms More efficient in the selection of taxi firms for control Compliance

You can always get an investment prioritized if it is about efficiency. (project manager)

This delimits the amount of resources on innovation activities over time, resulting in a situation where innovation is sidelined or simply pushed out from the formal project charters.

Practically all projects are focused on efficiency effects, measuring Full Time Equivalents. That hinders a lot if one is supposed to be innovative. (project manager)

4.2.3. Short-term focus

Efficiency creep is related to, sometimes even leading to, a short-term focus on IT investments.

And this is the problem that we think about very short steps … we have a financing model saying that [all] things we change are called "development" when it actually is not development but just a change of the administrative product. The other is that we plan for one year and now they say that we need to be very "crispy" in 2018 … while we will also have a three-year plan which has a bit more space … but the financing model is built on one year and so we do invest one year at a time. (line manager)

According to the Swedish constitution, the agency is loosely coupled with government. This dates back to changes in the constitution in the 16th century under the rationale of making sure that the branches of the government were not subject to radical changes on account of changes in the central government. At the same time, the agencies are controlled through steering documents specifying the contemporary assignment granted by the government.

The steering document says that we should do about the same thing as last year a bit better, quicker, and cheaper. Current mission, cautious changes. CEOs, government offices, and leaders are molded to the idea of following the steering document. The government is extremely clear to push that – don't do anything else. (business developer)

This setup creates a situation where the steering document is general and stable in its description of what the assignment of the agency is. The primary focus is on continuing to deliver the agreed-upon services to the citizens at a decreased cost, which brings continuous improvements and short-term efficiency gains to the foreground.

In conjunction with the short-term focus on efficiency gains, the CEO of the agency is politically assigned to follow the political four-year life cycle. A new government will in many cases assign a new CEO, making CEO tenure relatively short.

And depending on which CEO that comes in, they have different demands and desires in terms of how you delegate responsibility and how much control they wish to have themselves. I have experienced two CEOs. They have positive and negative sides, both of them. But primarily they are each other's opposites. My arms are not wide enough to describe those extremes. They are entirely different as people. With entirely different needs or desires in terms of scope of control. (line manager)

The consequence of a strong focus on short-term efficiency gains is a lack of senior buy-in for innovation activities since these are not seen as a direct part of the assignment. In addition, with short tenure, the focus is pushed towards short-term gains, i.e., plannable and executable within a single year. This makes official thinking about future innovation scenarios challenging, with detrimental effects on the underlying infrastructure as a direct consequence.

But what the hell … January 1st, there is still a lot to do until the new yearly period. So, it becomes very short-sighted and fidgety, and, if we consider that we have steered agencies like that for the past 20, the architecture is one bloody bowl of spaghetti, because we always have to go for the short-sighted solutions. (business developer)

4.2.4. Risk aversion

With the short-term perspective comes an inability to approach calculated risk and opportunity. The resulting risk aversion permeates the practice of investment prioritisation, and over time becomes accepted within the organisation.

One cannot have an innovation budget … and say that we get nothing out from 80% but these 20% will become

so bloody good. It is not possible. So, risk acceptance is zero … (business developer)

The risk aversion manifests itself in an increasing dependency on pre-studies, which tend to overrun and be used as a means of decreasing the innovation push within the organisation. Instead of accepting calculated risk, the organisation gets stuck in analysis paralysis, where the pre-study is not deemed complete until all risk is identified and managed. This paralysis creates a situation where "unknown unknowns" are conflated with "known unknowns" due to there being a lack of data to address risks.

> *We cannot start everything else if we cannot describe the benefits first and that is … for big innovation initiatives that becomes highly theoretical. We do not really know until we have tried it in some form of proof-of-concept or in an innovation laboratory or something. We would need to do it, so it becomes like 'But let's go for the safe. This is something we can describe an effect for. We can quantify this because we have data to do it.' (portfolio manager)*

4.2.5. Loan-based funding

Since the majority of new initiatives are pushed as efficiency gains, the bulk of the allocated development budget goes into incremental improvements in maintenance and operations and compliance with new regulation, which creates a situation where development is not seen as something new, but rather becomes conflated with maintenance and operations. In parallel, the practice of loan-based funding for development, as advocated by the expert agencies in the government, adds to a tendency to focus on short-term benefits that breed risk averseness.

> *It is pure maintenance to update that service … that is not development. But since we have a funding model that says it is development then we believe it is development. (portfolio manager)*

Through funding the bulk of development through loans, the organisation gets stuck in a situation where investments with a short-term positive effect on financial payback will be prioritised. At the same time, the accounting schemes related to an inclusion into the balance sheet stipulates that the investment needs to result in an asset (fixed or immaterial) with sustainable value over time.

> *The biggest part [of the development budget] is funded through loans, and then it is really important that this results in a productivity increase so that we get something out of it. Otherwise we create … because it turns into a cost that we need to handle. And this has gotten a lot more focus during the last years … Well, how can we get a development plan in balance? We need to have a certain amount of financial revenue to get it in balance. (controller)*

All in all, efficiency creep together with short-term focus, risk aversion, and the subsequent loan funding scheme for IT investments leads to "shadow innovation".

> *So, risk acceptance is zero, and how does that then result in innovation? Then the IT department needs to do many things under the radar. (business developer)*

4.2.6. The exploration mechanism: shadow innovation

Innovation initiatives are pre-dominantly expunged from the formal side of IT Governance since they are associated with significant risk, and potential benefits are less likely to accrue in the short term. Innovation thus becomes something that is impossible to prioritise through the formal investment prioritisation and loan-based financing process, and hence something that the organisation as a whole cannot address through its formal channels, thus resulting in innovation being pushed to the shadows of control, i.e., becoming shadow innovation.

> *It becomes a bit such guerilla activities … IT-departments have through times always found a good number of cool, good things and it easily becomes technology-driven … it is stealth innovation. (business developer)*

4.2.7. Autonomy

The extent to which shadow innovation can occur depends upon the level of autonomy with which the organisation and its co-workers are endowed. The high demands placed upon the development function in the organisation, coupled with the high level of complexity and strain of resources results in a situation where project managers and the IT department are assigned substantial autonomy in executing their tasks.

> *So, the IT department does a lot of things under the radar. If those would have been a part of some innovation plan, or some ambition, about how we should invest our money here …. (business developer)*

Hence, a substantial amount of activities conducted as shadow innovation is not visible to the rest of the organisation. These activities face potential risks of redundancy and shortcomings with regard to the potential scaling of the innovations.

> *…, but there are lot of such things going on. For example, we have five, five assignments to look at text analysis, that is, artificial intelligence, but they have kind of emerged. They might not even be aware of each other. (business developer)*

In the line organisation, lack of autonomy hinders initiation of innovation opportunities.

> *Our structures do not support innovation, as now it does not start unless business developers here in the*

headquarters or some chief officer comes to an idea. It is very centralized in this way. (business developer)

The new (although minor in relation to the whole IT budget) initiative of establishing an innovation hub has brought another autonomous space focusing on innovation (in addition to the IT department) and relates to some resources with slack.

It is one of the biggest things … that we now have room and freedom to share ideas. (innovation hub manager)

4.2.8. Slack

The high level of autonomy associated with executing development and maintenance projects based on agreed-upon charters also induces slack in the organisation. With the project managers knowledgeable that they will need to include innovation activities, they plan their projects to allow for the required innovation happening in this slack. Albeit not accepted and in direct conflict with the overarching ideas about agency efficiency, this slack affords shadow innovation.

Part of the explanation for why this type of soldiering is possible lies in the uneven distribution of understanding surrounding IT and development. With the IT organisation (predominantly) being well adept with the governance and control configurations for development, this results in a shift in power away from the business towards the IT side.

We have shortages in competence when it comes to both governing and managing development on the business side, which results in IT stepping in and taking responsibility where they should not … Or the biggest problem concerns IT sneaking in a platform change; technology that drives development linked to the needs that they see. But, if you do that tucked away in the overarching business development projects … I think we allocate much of the development budget on this type of technology debt … I would like it to be a little more transparent. (line manager)

The potential risks of this type of behaviour lie partly in the IT organisation misunderstanding the overarching business demands, and activities and initiatives becoming opaque.

We have a very strong IT organization. Competent, good, industrious, want, and can do. Unfortunately, I guess some parts of the IT organization think that they understand the business to a much higher extent than what they actually do. (line manager)

4.2.9. Opportunities

At the core of innovation lies the ability to identify and seize opportunities. With shadow innovation happening outside the formal scope of control, this process becomes highly dependent upon individuals rather than formal routines. Since the projects (e.g., artificial intelligence applications for case-decisions, mobile apps claim submission) are unsanctioned from the

start, they run the risk of becoming a sunk cost due to an inability by the individuals to implement the innovation in the organisation.

I have tried now, with two mobile apps already … the first nobody wanted, because it stepped on the wrong toes … That made me learn. Everybody needs to be on board … but not everyone can … there would become too many … so many people will have issues when it is time for implementation. (innovation hub manager)

If the innovation is not considered an opportunity (i.e., accepted by the organisation), it is hidden along with the consumed resources, resulting in a lack of feedback to the planning and prioritisation process. In other words, institutionalising learning from mistakes becomes unlikely and the organisation will continue to increase its shadow innovation.

I think XX [top manager on innovation portfolio] became disappointed when eight out of ten new development ideas came from the IT department, being most often about "can we get a bit more money so that we can test this and that cool stuff"? Then the focus was not on innovation on business but just on testing a new cool technology, to get that in. (line manager)

4.2.10. The ambidextrous mechanism

The ambidextrous mechanism for public sector IT Governance that this study has identified consists of the aforementioned mechanisms of efficiency creep and shadow innovation, and their interrelationship. According to the findings, efficiency creep drives shadow innovation, which in turn inhibits efficiency creep. This intricate dance between the exploitation and exploration activities conducted within the organisation constitutes the ambidextrous IT Governance mechanism (Figure 6).

4.2.11. How efficiency creep drives shadow innovation

Shadow innovation can be regarded as an organisational response towards the risk of becoming obsolete. In this respect, shadow innovation acts as part of the organisation's immune system in fighting off the negative effects of an overemphasis on exploitation for short-term benefits at the expense of long-term success.

For us to stay with the times and be relevant for our citizens, it is about fulfilling our mission. The state's value base and achieving the intentions of the politicians, and we should do this in an efficient manner. If we are to be able to do this in the future … and if we continue to solely pursue efficiency, then we will … become extremely cost-efficient, and extremely irrelevant … so we need to reallocate all the time, to innovation. (business developer)

From this perspective, signs of looming irrelevance are coupled with frustration in terms of the time-
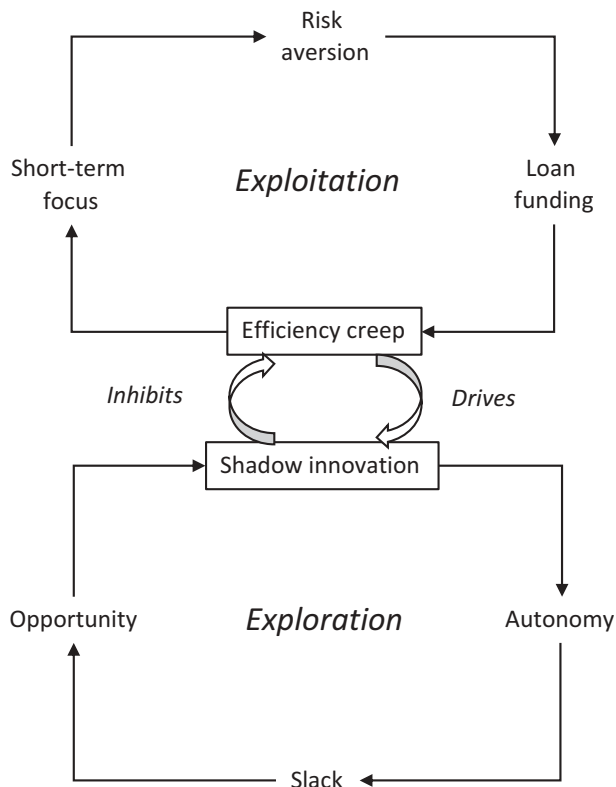
Figure 6. The ambidextrous IT Governance mechanism.

consuming bureaucracy and the organisation's inability to act proactively. The consequence is that the organisation feels the need for urgent, sub-optimised innovation activities.

> We are generally in a hurry once we get started. We have a lot of this 'We need to get going with our project and we are going to do this.' And you have too much focus on the solution; too little focus on what you actually want to achieve and too little focus on alternative ways of achieving it. (controller)

The lack of accountability and assigned formal responsibility for innovation to C-level management is another driver for increased shadow innovation. With innovation being simultaneously everyone's and no one's responsibility, no central budget is assigned for innovation. From this respect, the existing configuration of IT Governance also drives increased shadow innovation.

> There is no budget to invest in new tools or new … there is some initiative on artificial intelligence, but there is no budget to start initiatives on artificial intelligence as such, so one needs to find an area which is willing to invest in that. (project manager)

> It can be that some managers dismiss suggested changes … but it can also be that our [development] processes are so bureaucratic that you lack the energy to hammer new suggestions through. (project manager)

In summary, efficiency creep drives shadow innovation through continually decreasing the budgetary room and accountability for exploration in the formal

IT Governance. This results in the organisation experiencing a looming loss of relevance and legitimacy over time, which in turn leads to increased shadow innovation as the primary mode of exploration.

4.2.12. How shadow innovation inhibits efficiency creep

As the level of shadow innovation increases in the organisation, the quota of resources spent on exploitation as a percentage of the whole diminishes, resulting in decreased efficiency and effectiveness in exploitation activities due to the practice of using induced slack as a source for innovation activities. The organisation reacts by becoming increasingly frustrated about losing out on benefits realisation from efficiency-oriented projects and about said projects becoming increasingly inefficient in themselves. At the same time, the individuals in the organisation regard innovation as pure experimentation, which stands in direct conflict with the overarching mission of the agency.

> Well, that we should have some sort of experimentation factory … Is that really what the SIA should be doing? … but that is really more of a political question …. (controller)

In contrast to this "going-concern" perspective, new directions are sought from the political realm. Direct changes in terms of the exploitation–exploration balance are only possible through directives coming from the government, and despite a general push towards Sweden becoming the best in the world in terms of digitalisation, there is a lack of clarity.

> You see the Minister of Interior say just this that 'now all the agencies should be digitalized' … I mean, I am not sure that gets you motivated …. (business developer)

The organisation responds by engaging in shadow innovation and through promoting new initiatives for structural ambidexterity such as innovation hubs. These initiatives are not designed to counteract shadow innovation, but rather to offer a conduit for a selection of innovation activities.

> I think it [unsanctioned innovation] is really good … I know that there is more innovation happening in other parts, and I think that is terrific … I just wish we could perhaps support it even more. (innovation hub manager)

The assigned budget for the innovation centre is marginal, but at the same time, it is an attempt from the organisation to signal innovation being relevant and necessary, i.e., inhibiting efficiency creep. New routines designed to counteract the tendency to overemphasise pre-studies are introduced, thus alleviating the strain on the efficiency creep procedures.

But that's the way they do it here, a lot of . . . analysis on the pre-study. You tend to get stuck here quite a lot . . . the innovation center is an alternative to the pre-study. (innovation hub manager)

In sum, shadow innovation inhibits efficiency creep through the organisation's frustration with the decrease in efficiency as an effect of the induced slack (i.e., efficiency gains becoming costlier). The organisation responds through imposing structural ambidexterity through organisational entities such as innovation hubs, which are seen as alternative channels to push innovation initiatives that are hence not handled as shadow innovation. The resulting pluralism in prioritisation processes acts to reduce efficiency creep.

4.3. Summary of results

Our results describe and address the issue of how public sector organisations enact ambidextrous IT Governance. The outset of this issue has been seeing public sector innovation as directly dependent upon the balancing of exploitation and exploration (see Figure 7).

Through the analysis of the two cases, we identified and explored the concepts of efficiency creep and shadow innovation. In the first case, we identified the concept of efficiency creep. Furthermore, we identified a misalignment between the ambidextrous balance in the tactical and operational levels, coined as shadow innovation. We identified similar evidence of efficiency creep and shadow innovation in the second case. While some initial, small-scale institutional actions were taken to enhance innovation in the case, we found that riskier, less efficiency-oriented innovations were still pushed to the shadows of control, under the radar of formal governance. Based on these two cases, we theorised about how shadow innovation emerges as a dynamic balancing mechanism for efficiency creep, and how these two concepts together represent an ambidextrous IT Governance mechanism in public sector organisations.

Figure 7 illustrates the interplay between efficiency creep and shadow innovation as found in our analysis. Efficiency creep acts to decrease the total formal spend on exploration (innovation) in the organisation, but simultaneously drives innovation to the fringes of control, i.e., increasing shadow innovation. This in turn inhibits efficiency creep and acts to decrease the total formal spend on exploitation by introducing slack into the financial planning of the projects.

5. Discussion

Our study makes two main contributions to the recent literature on ambidextrous IT Governance in the public sector in direct response to Janssen and Van der Voort (2016) call for research into adaptive governance. First, we identify and conceptualise two mechanisms (efficiency creep and shadow innovation) and their interrelationship that explains the enactment of ambidextrous IT Governance in our target organisations. Second, the STA case illustrates an example of quantitative audit of shadow innovation in the public sector. Previous studies of, e.g., skunk works (Rich & Janos, 2013) or permissionless innovation (Thierer, 2016) have been conducted through studying single instances rather than the consummate level of shadow innovation. Quantitative assessment at the organisational levels of shadow innovation in the STA can also be regarded as a methodological contribution to study the ambidextrous balance between exploration and exploitation. The measurements of the ambidextrous balance in the strategic, tactical, and operative levels in the STA case displayed a misalignment towards efficiency creep at the tactical level of the investment portfolio. If the organisation is significantly misaligned in terms of how much emphasis they place on efficiency vs. innovation between the different layers,
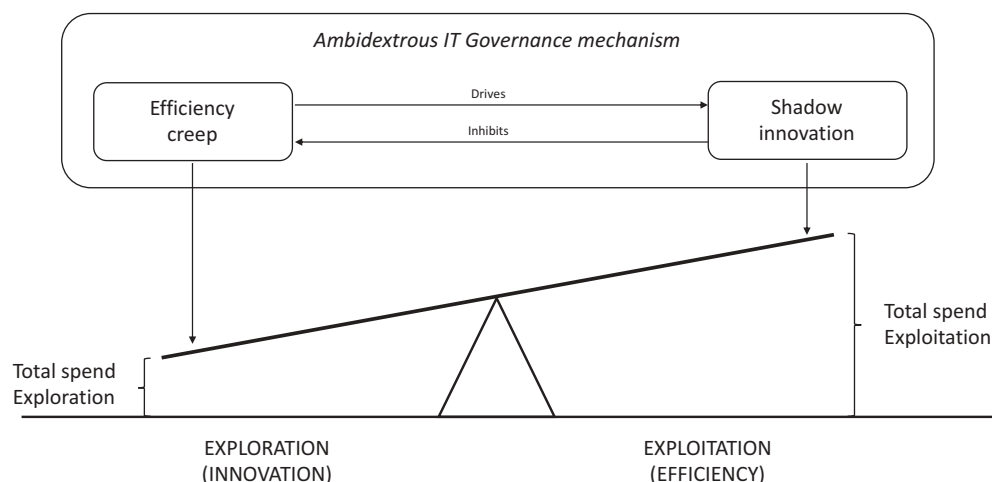

Figure 7. The ambidextrous mechanism and its implications.

the outlying layer will be a good place to start analysing and potentially improve.

The identification of the exploitation mechanism of efficiency creep guides future research into how efficiency biases are enacted in public sector organisations. The identification of factors on the strategic, tactical, and operative levels of the organisation answers the call from Wiener et al. (2016) about control enactment, highlighting the deeply vested nature of efficiency creep. In contrast with Gregory et al.'s (2015) observation about the "drift to efficiency," as seen in their case of ambidextrous IT transformation, the identified mechanism and its elements are not directly translatable into something within the sole scope of control of the IT department. As we show, the elements leading to efficiency creep are more related to aspects such as funding practice, process, and governance complexities. In addition, the power of the IT department is in itself seen as a prerequisite for efficiency creep through the unevenly distributed competence related to development and their tendency towards risk averseness. Hence, our analysis would not necessarily support Gregory et al.'s (2015) previous recommendations for increased power in the IT department as a means for balancing ambidexterity.

We argue that the mechanisms of efficiency creep and shadow innovation add new insight into the concept of adaptive governance (Janssen & Van der Voort, 2016). While Janssen and Van der Voort (2016) identify the concepts of "competency trap" and "failure trap" as the extremes of unbalanced focus on exploitation and exploration, respectively, our research sheds new light on how shadow innovation emerges as a balancing mechanism for efficiency creep in both target organisations. In the Swedish context, the contemporary political milieu (largely focused on risk aversion and the ideals of NPM) would most likely prevent too much innovation and the "failure trap." However, our results suggest that more focus should be targeted on avoiding the competency trap, which could be reached by identifying mechanisms of shadow innovation, institutionalising the most influential ones, and coordinating benefits realisation from innovations better while still avoiding overt formalisation.

Through these findings, we concur that the configuration of IT Governance needs to change so that it does not risk alienating innovation activities by pushing them to the shadows. In line with our argumentation for a current shift in IT Governance practice, such an acknowledged, ambidextrous approach (Gregory et al., 2015; Luger et al., 2018; Zimmermann et al., 2018) needs additional research to derive a sound basis for normative results.

Our findings contradict the proposition by Cram et al. (2016), which claims that uncertainty is expected to necessitate control adjustment and reliance on formal control. Instead of leading to increased reliance on formal control, the case organisations pushed innovation to the shadows of control. In this manner, the observed dynamic relationship between efficiency creep (enacted formal control) and shadow innovation (enacted formal/informal/lack of control) thus contradicts the proposition for increased formal control in the conditions of uncertainty. Our analysis also challenges another proposition by Cram et al. (2016) on emergent technology inducing control experimentation (i.e., experiments where new forms of control are evaluated). In our target organisations, control experimentation was solely enacted informally, thus opening for a necessary nuancing of what control experimentation may involve, and what happens when it takes place in the shadows of control, unsanctioned, and without clear feedback loops for learning (cf. Soe & Drechsler, 2017, on the use of experimentation in local governments).

As Wiener et al. (2016) noted, control enactment and the control portfolio interact through activities that are often not addressed in research. Our study analysed such activities, finding that the mechanism involving efficiency creep and shadow innovation together constitute a foundation for the enactment of ambidexterity. The expressed lack of dynamic approaches to control enactment (less than 18% of the literature according to Wiener et al., 2016) may in this perspective be regarded as a potential ruse. Our findings point to the existence of a dynamic approach involving an interplay between formal and informal control. Hence, future studies may benefit from addressing such interplay to discover naturally occurring but hidden dynamism in control enactment. Our findings contradict Wiener et al. (2016) third conjecture that formal controls enacted through an enabling control style facilitate the enactment of informal controls. In the two cases, shadow innovation was enacted through a mix of formal and informal control mechanisms (cf. Benner & Tushman, 2003, and their notion of strategic linkage), whereby the mechanism itself became muddled in the formal–informal conceptualisation. From this respect, the observed mechanism cuts across various forms of control, thus challenging the underlying dichotomy and opening for a new perspective on contextual ambidexterity (Raisch & Birkinshaw, 2008). The suggested perspective adds to the recent discussions addressing the need for dynamic approaches towards balancing between efficiency and innovation, as described by Luger et al. (2018) in their study of the necessary temporal balancing/rebalancing between exploration and exploitation, and by Zimmermann et al. (2018) in their identification of front-line managers as the primary enactors of ambidexterity.

5.1. Implications for practice

Three main implications for practice stem from our research. First, we propose that ambidexterity could be considered a socially evolving phenomenon within the context of organisations, rather than an aspirational goal to be attained. From this perspective, ambidexterity should be assumed to exist in organisations, whereby the main challenge faced by management is how to recognise and cultivate it. As we have shown, the aspired strategic balance between exploration and exploitation may not align with the tactical and operative balances, whereby the notion of alignment needs to include ambidexterity. In addition, the balancing point between exploration and exploitation is contingent upon changes in the outside environment, which translates into a varying need for innovation over time. Hence, setting the aspired balance needs to be complemented with processes for continual re-evaluation of said balance, as well as processes for monitoring and management (Luger et al., 2018). The method we suggest for auditing the ambidextrous balance could be used as inspiration for attaining an initial measurement.

Second, the dominance of formalised IT Governance (often imported from business into the public sector) needs to be complemented with means for alleviating the risk of alienating individuals pursuing innovation. Such means could include alternative modes for prioritisation or innovation hubs. The organisation needs to be aware of the inherent risks of pushing innovation initiatives into the shadows, risks such as a decrease in scalability and an increase of redundancies.

Third, in line with the anecdotal evidence from Lockheed Martin in relation to skunk work (Miller, 1995; Rich & Janos, 2013), certain types of innovation activities are perhaps best kept in the shadows. In Norse mythology, Trolls (which, unlike innovation activities, were not initially regarded as positive elements) are portrayed as turning to stone if exposed to sunlight. That is, certain innovation activities may run the risk of being petrified by formal controls. The organisation thus needs to carefully assess how they structure their innovation work to avoid the risk of the quest for scalability trumping potentially disruptive innovations.

5.2. Future research

We see four specific avenues for future research emerging from our study. First, the identified role of slack and autonomy related to the exploration mechanism of shadow innovation is one that should be addressed further. As noted by Roberts et al. (2016), the mediating effect of autonomy on idea diversity and volume could be seen as directly linked to slack. Increased autonomy creates a space in which the individual is free(er) to pursue her agenda. The level of autonomy is hence a potential metric that could inform the study of organisational slack. Traditional perspectives see slack in terms of resources not directly tied to production, i.e., buffering resources. Slack therefore becomes a function of autonomy, something that warrants additional research to increase our understanding of how slack should be managed in the public sector (see Rahrovani et al., 2018, and their work on the management of slack).

Second, the idea of IT business partnering, which was proposed by Gregory et al. (2015, p. 73) as the necessary prerequisite for paradox resolution and ambidexterity, was problematised by our findings. While the idea has merit, our findings suggest that the relationship between the IT department and ambidexterity is more complex. Future research would need to address the dual role of IT championship, where the guiding principle could be one of the equilibristic power distribution between IT and the business rather than a continuous increase of IT's power. Hence, continued digitalisation in the public sector should be studied, not through de-facto seeing increased power in IT as beneficial (see Banker et al., 2011 for an elaboration on this) but as a potential source of challenges.

Third, our observation that ambidexterity is not a state of balance but a process of balancing between mechanisms of efficiency and innovation suggests further investigation. This would include studying organisations of varying sizes within both the public and private sectors, in an attempt to reach a more nuanced understanding of mechanisms contributing to the dynamic balancing and enactment of ambidexterity as seen in Zimmermann et al. (2018) and Luger et al. (2018). In addition, future research could also examine the potential contingencies and synergistic effects of balance and magnitude of exploration and exploitation demands (Cao et al., 2009). While such literature of the synergistic effects draws upon studies in the private sector, comparable research on the public sector remains to be done. In our study, the target organisations were yet to reach mechanisms for more explicit balancing and scaling of the exploration activities, while the both were biased towards exploitation, leading to the identified mechanisms of efficiency creep and shadow innovation.

Fourth, the notion of networked governance (Yli-Huumo et al., 2018) and hence the shift to networked innovation (Lyytinen et al., 2016) needs to be addressed in future research. As we found indications of networked innovation initiatives related to cross-organisational ideas for developing public services, future research needs to consider this particular perspective and examine how an increased reliance on inter-organisational innovation will influence the

organisation-level mechanisms identified in our study. This line of research may call for new types of governance configurations.

5.3. Limitations

Our study has at least three limitations regarding generalisability. First, both organisations targeted in our study represent large and strong, independent public agencies. Hence, our results can be regarded as delimited in light of recent innovation literature that calls for research on networked innovation (Lyytinen et al., 2016), which has emerged as important in the public sector as well (Yli-Huumo et al., 2018). While our data involved traces of informal networking among individual professionals interacting across the organisational agency borderlines, the current innovation milieu among the target organisations did not represent networked innovation yet. However, we argue that, even in the networked innovation platforms, the ambidextrous IT Governance mechanisms inside the organisations in charge of particular domains of public services need to be understood and cultivated. In addition, the majority of literature utilised in this paper entails the perspective of large organisations, alike our target organisations. On the basis of contingency studies within the field of management control (Otley, 2016), we would assume that smaller organisations may differ in terms of autonomy and bureaucracy, which would invariably change the way in which ambidexterity is enacted.

Second, as hypothesised by Janssen and Van der Voort (2016), adaptive governance is associated with the potential traps of competence and failure. Our study involved organisations where the ambidextrous balancing point was heavily tilted towards exploitation rather than exploration. For organisations with a tilt towards exploration rather than exploitation, i.e., an emphasis on innovation, we would likely meet different enactment mechanisms. Hence, our results are limited by the empirical selection, and further studies of organisations with a greater emphasis on innovation would give additional insights. In the current public sector context, however, we deem this type of organisation to be in the minority.

Third, the fact that both cases in this study represent the institutional setting of Swedish government, including role of political and societal culture constitute an additional limitation for our findings. As noted by Bannister (2007), there are substantial problems associated with comparing and transferring insights across different institutional environments such as agencies acting in different countries. However, we would argue that our case study anyhow has resulted in new theoretical insights to inform the emerging field of ambidextrous IT governance, while discussions on the potential influence of cultural and institutional differences could continue elsewhere.

5.4. Conclusion

This study aimed to answer the research question of how ambidextrous IT Governance is enacted in public sector organisations. The findings show that an ambidextrous mechanism involving exploitation and exploration balances an organisation's simultaneous strive for efficiency and innovation. In terms of the exploitation mechanism, efficiency creep acts through continually decreasing the room for innovation initiatives as part of the investment portfolio(s) through making increased efficiency the only legitimate rationale for investments, especially at the tactical level. This development is counteracted by the exploration mechanism, where shadow innovation acts through increasing the amount of total spend on innovation, albeit not visible in any other form than slack. These two mechanisms interact through efficiency creep driving shadow innovation, and shadow innovation inhibiting efficiency creep. The resulting ambidextrous IT Governance mechanism is proposed as a novel approach towards studying IT Governance enactment in public sector organisations. Our hope is that an increased understanding of ambidextrous IT Governance enactment will increase public sector innovation capabilities over time.

Disclosure Statement

No potential conflict of interest was reported by the authors.

References

Adler, P. S., Goldoftas, B., & Levine, D. I. (1999). Flexibility versus efficiency? A case study of model changeovers in the Toyota production system. *Organization Science*, *10* (1), 43–68. https://doi.org/10.1287/orsc.10.1.43

Anthony, R. N. (1965). *Planning and Control Systems: A Framework for Analysis*. Division of Research, Graduate School of Business Administration, Harvard University.

Archibugi, D. (2017). Blade Runner economics: Will innovation lead the economic recovery? *Research Policy*, *46* (3), 535–543. https://doi.org/10.1016/j.respol.2016.01.021

Askarany, D., & Yazdifar, H. (2007). Why ABC is not widely implemented? *International Journal of Business*, *7*(1), 93–98.

Banker, R. D., Hu, N., Pavlou, P. A., & Luftman, J. (2011). CIO reporting structure, strategic positioning, and firm performance. *MIS Quarterly*, *35*(2), 487–504. https://doi.org/10.2307/23044053

Bannister, F. (2007). The curse of the benchmark: An assessment of the validity and value of e-government comparisons. *International Review of Administrative Sciences*, *73*(2), 171–188. https://doi.org/10.1177/0020852307077959

Benner, M. J., & Tushman, M. L. (2003). Exploitation, exploration, and process management: The productivity dilemma revisited. *Academy of Management Review*, *28* (2), 238–256. https://doi.org/10.5465/amr.2003.9416096

Birkinshaw, J., & Gibson, C. (2004). Building ambidexterity into an organization. *MIT Sloan Management Review*, *45*, 47–55.

Birkinshaw, J., Zimmermann, A., & Raisch, S. (2016). How do firms adapt to discontinuous change? Bridging the

dynamic capabilities and ambidexterity perspectives. *California Management Review*, 58(4), 36–58. https://doi.org/10.1525/cmr.2016.58.4.36

Boonstra, A., Yeliz Eseryel, U., & van Offenbeek, M. A. (2017). Stakeholders' enactment of competing logics in IT governance: Polarization, compromise or synthesis? *European Journal of Information Systems*, 27(4), 415–433. https://doi.org/10.1057/s41303-017-0055-0

Cao, Q., Gedajlovic, E., & Zhang, H. (2009). Unpacking organizational ambidexterity: Dimensions, contingencies, and synergistic effects. *Organization Science*, 20(4), 781–796. https://doi.org/10.1287/orsc.1090.0426

Chen, D. Q., Preston, D. S., & Xia, W. (2010). Antecedents and effects of CIO supply-side and demand-side leadership: A staged maturity model. *Journal of Management Information Systems*, 27(1), 231–272. https://doi.org/10.2753/MIS0742-1222270110

Chi, M., Zhao, J., George, J. F., Li, Y., & Zhai, S. (2017). The influence of inter-firm IT governance strategies on relational performance: The moderation effect of information technology ambidexterity. *International Journal of Information Management*, 37(2), 43–53. https://doi.org/10.1016/j.ijinfomgt.2016.11.007

Choi, T., & Chandler, S. M. (2015). Exploration, exploitation, and public sector innovation: An organizational learning perspective for the public sector. *Human Service Organizations: Management, Leadership and Governance*, 39(2), 139–151.

Cram, W. A., Broham, K., & Gallupe, R. B. (2016). Information systems control: A review and framework for emerging information systems processes. *Journal of the Association for Information Systems*, 17(4), 216–266. https://doi.org/10.17705/1jais.00427

Crossan, M. M., & Apaydin, M. (2010). A multi-dimensional framework of organizational innovation: A systematic review of the literature. *Journal of Management Studies*, 47(6), 1154–1191. https://doi.org/10.1111/j.1467-6486.2009.00880.x

Dawson, G. S., Denford, J. S., Williams, C. K., Preston, D., & Desouza, K. C. (2016). An examination of effective IT governance in the public sector using the legal view of agency theory. *Journal of Management Information Systems*, 33(4), 1180–1208. https://doi.org/10.1080/07421222.2016.1267533

Duncan, R. B. (1976). The ambidextrous organization, designing dual structures for innovation. *The Management of Organization*, (1), 167–188.

Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review*, 14(4), 532–550. https://doi.org/10.5465/amr.1989.4308385

Fossestøl, K., Breit, E., Andreassen, T. A., & Klemsdal, L. (2015). Managing institutional complexity in public sector reform: Hybridization in front-line service organizations. *Public Administration*, 93(2), 290–306. https://doi.org/10.1111/padm.12144

Gibson, C. B., & Birkinshaw, J. (2004). The antecedents, consequences, and mediating role of organizational ambidexterity. *Academy of Management Journal*, 47(2), 209–226.

Grabski, S. V., Leech, S. A., & Schmidt, P. J. (2011). A review of ERP research: A future agenda for accounting information systems. *Journal of Information Systems*, 25(1), 37–78. https://doi.org/10.2308/jis.2011.25.1.37

Gregory, R. W., Kagener, E., Henfridsson, O., & Ruch, T. J. (2018). IT consumerization and the transformation of IT Governance. *MIS Quarterly*, 42(2), 1225–1253.

Gregory, R. W., Keil, M., Muntermann, J., & Mähring, M. (2015). Paradoxes and the nature of ambidexterity in IT transformation programs. *Information Systems Research*, 26(1), 57–80. https://doi.org/10.1287/isre.2014.0554

Guillemette, M. G., & Paré, G. (2012). Toward a new theory of the contribution of the IT function in organizations. *MIS Quarterly*, 36(2), 529–551. https://doi.org/10.2307/41703466

Gwynne, P. (1997). Skunk works, 1990s-style. *Research-Technology Management*, 40(4), 18–23. https://doi.org/10.1080/08956308.1997.11671138

Haffke, I., Kalgovas, B., & Benlian, A. (2017). Options for transforming the IT function using bimodal IT. *MIS Quarterly Executive*, 16(2), 101–120.

Hansén, S. O., & Wakonen, J. (1997). Innovation, a winning solution? *International Journal of Technology Management*, 13(4), 345–358. https://doi.org/10.1504/IJTM.1997.001668

Henfridsson, O., & Bygstad, B. (2013). The generative mechanisms of digital infrastructure evolution. *Mis quarterly*, 907–931.

Heracleous, L., Yniguez, C., & Gonzalez, S. A. (2019). Ambidexterity as historically embedded process: Evidence from NASA, 1958 to 2016. *The Journal of Applied Behavioral Science*, 55(2), 161–189.

Huang, J., Henfridsson, O., Liu, M. J., & Newell, S. (2017). Growing on steroids: Rapidly scaling the user base of digital ventures through digital innovation. *MIS Quarterly*, 41(1), 301–314. https://doi.org/10.25300/MISQ

Janowski, T. (2015). Digital government evolution: From transformation to contextualization. *Government Information Quarterly*, 32(3), 221–236. https://doi.org/10.1016/j.giq.2015.07.001

Janssen, M., & Van der Voort, H. (2016). Adaptive governance: Towards a stable, accountable and responsive government. Editorial. *Government Information Quarterly*, 33(1), 1–5. https://doi.org/10.1016/j.giq.2016.02.003

Junni, P., Sarala, R. M., Taras, V., & Tarba, S. Y. (2013). Organizational ambidexterity and performance: A meta-analysis. *Academy of Management Perspectives*, 27(4), 299–312. https://doi.org/10.5465/amp.2012.0015

Kallinikos, J. (2010). *Governing through technology: Information artefacts and social practice*. Palgrave Macmillan.

Kankanhalli, A., Zuiderwijk, A., & Tayi, G. K. (2017). Open innovation in the public sector: A research agenda. *Government Information Quarterly*, 34(1), 84–89. https://doi.org/10.1016/j.giq.2016.12.002

King, W. R., & Teo, T. S. (2000). Assessing the impact of proactive versus reactive modes of strategic information systems planning. *Omega*, 28(6), 667–679. https://doi.org/10.1016/S0305-0483(99)00079-1

Luger, J., Raisch, S., & Schimmer, M. (2018). Dynamic balancing of exploration and exploitation: The contingent benefits of ambidexterity. *Organization Science*, 29(3), 449–470. https://doi.org/10.1287/orsc.2017.1189

Lutchen, M. D. (2011). *Managing IT as a business: A survival guide for CEOs*. John Wiley and Sons.

Lyytinen, K., Yoo, Y., & Boland, R. J., Jr (2016). Digital product innovation within four classes of innovation networks. *Information Systems Journal*, 26(1), 47–75. https://doi.org/10.1111/isj.12093

MacDuffie, J. P. (1997). The road to root cause: Shop-floor problem-solving at three auto assembly plants. *Management Science*, 43(4), 479–502. https://doi.org/10.1287/mnsc.43.4.479

Magnusson, J. (2010). *Unpackaging IT Governance*. BAS Publishing.

Magnusson, J., & Bygstad, B. (2013). Why I act differently: Studying patterns of legitimation among CIOs through motive talk. *Information Technology and People*, *26*(3), 265–282. https://doi.org/10.1108/ITP-10-2012-0117

Magnusson, J., & Nilsson, A. (2015). *Enterprise system platforms: Transforming the Agenda*. Studentlitteratur.

Magnusson, J., Torell, J., Polutnik, L., & Ask, U. (2017). Ambidextrous IT governance in the public sector: A revelatory case study of the swedish tax authorities. In Lazar Rusu and Gianluigi Viscusi (eds.), *Information technology governance in public organizations* (pp. 253–267). Springer.

March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science*, *2*(1), 71–87. https://doi.org/10.1287/orsc.2.1.71

McNair, C. J., Polutnik, L., & Silvi, R. (2001). Cost management and value creation: The missing link. *European Accounting Review*, *10*(1), 33–50. https://doi.org/10.1080/09638180122848

Meijer, A. (2015). E-governance innovation: Barriers and strategies. *Government Information Quarterly*, *32*(2), 198–206. https://doi.org/10.1016/j.giq.2015.01.001

Mergel, I. (2016). Agile innovation management in government: A research agenda. *Government Information Quarterly*, *33*(3), 516–523. https://doi.org/10.1016/j.giq.2016.07.004

Mergel, I., Gong, Y., & Bertot, J. (2018). Agile government: Systematic literature review and future research. *Government Information Quarterly*, *35*(3), 291–298. https://doi.org/10.1016/j.giq.2018.04.003

Merton, R. K. (1958). The functions of the professional association. *The American Journal of Nursing*, *58*(1), 50–54.

Miller, J. (1995). Lockheed's skunk works: The first fifty years. *Air Power History*, *42*(1), 52–53.

Mintzberg, H., & McHugh, A. (1985). Strategy formation in an adhocracy. *Administrative Science Quarterly*, *30*(2), 160–197. https://doi.org/10.2307/2393104

Mithas, S., & Rust, R. T. (2016). How information technology strategy and investments influence firm performance: Conjecture and empirical evidence. *MIS Quarterly*, *40*(1), 223–245. https://doi.org/10.25300/MISQ

Modell, S. (2009). In defense of triangulation: A critical realist approach to mixed methods research in management accounting. *Management Accounting Research*, *20*(3), 208–221. https://doi.org/10.1016/j.mar.2009.04.001

Mulgan, G., & Albury, D. (2003). Innovation in the public sector. *Strategy Unit, Cabinet Office*, *1*(1), 40.

Myers, N., Starliper, M. W., Summers, S. L., & Wood, D. A. (2017). The impact of shadow IT systems on perceived information credibility and managerial decision making. *Accounting Horizons*, *31*(3), 105–123. https://doi.org/10.2308/acch-51737

Nambisan, S., Lyytinen, K., Majchrzak, A., & Song, M. (2017). Digital innovation management: Reinventing innovation management research in a digital world. *MIS Quarterly*, *41*(1), 223–238. https://doi.org/10.25300/MISQ

O'Reilly, C. A., & Tushman, M. L. (2013). Organizational ambidexterity: Past, present, and future. *The Academy of Management Perspectives*, *27*(4), 324–338. https://doi.org/10.5465/amp.2013.0025

Osborne, S. P. (2006). The new public governance? *Public Management Review*, *8*(3), 377–387. https://doi.org/10.1080/14719030600853022

Otley, D. (2016). The contingency theory of management accounting and control: 1980–2014. *Management Accounting Research*, *31*, 45–62. https://doi.org/10.1016/j.mar.2016.02.001

Peterson, R. (2004). Crafting information technology governance. *Information Systems Management*, *21*(4), 7–22. https://doi.org/10.1201/1078/44705.21.4.20040901/84183.2

Rahrovani, Y., Pinsonneault, A., & Austin, R. D. (2018). If you cut employees some slack, will they innovate? *MIT Sloan Management Review*, *59*(4), 47–51.

Raisch, S., & Birkinshaw, J. (2008). Organizational ambidexterity: Antecedents, outcomes, and moderators. *Journal of Management*, *34*(3), 375–409. https://doi.org/10.1177/0149206308316058

Raisch, S., & Tushman, M. L. (2016). Growing new corporate businesses: From initiation to graduation. *Organization Science*, *27*(5), 1237–1257. https://doi.org/10.1287/orsc.2016.1081

Rich, B. R., & Janos, L. (2013). *Skunk works: A personal memoir of my years of Lockheed*. Little, Brown.

Roberts, N., Campbell, D. E., & Vijayasarathy, L. R. (2016). Using information systems to sense opportunities for innovation: integrating postadoptive use behaviors with the dynamic managerial capability perspective. *Journal of Management Information Systems*, *33*(1), 45–69.

Romanelli, E., & Tushman, M. L. (1994). Organizational transformation as punctuated equilibrium: An empirical test. *Academy of Management Journal*, *37*(5), 1141–1666.

Salge, T. O., Kohli, R., & Barrett, M. (2015). Investing in information systems: On the behavioral and institutional search mechanisms underpinning hospitals' IS investment decisions. *MIS Quarterly*, *39*(1), 61–89. https://doi.org/10.25300/MISQ

Schumpeter, J. (1927). The explanation of the business cycle. *Economica*, *21*(21), 286–311. https://doi.org/10.2307/2548401

Siggelkow, N., & Levinthal, D. A. (2003). Temporarily divide to conquer: Centralized, decentralized, and reintegrated organizational approaches to exploration and adaptation. *Organization Science*, *14*(6), 650–669. https://doi.org/10.1287/orsc.14.6.650.24840

Simons, R. (1995). *Levers of Control*. Harvard Business School Press.

Simsek, Z., Heavey, C., Veiga, J. F., & Souder, D. (2009). A typology for aligning organizational ambidexterity's conceptualizations, antecedents, and outcomes. *Journal of Management Studies*, *46*(5), 864–894. https://doi.org/10.1111/joms.2009.46.issue-5

Singh, A., & Hess, T. (2017). How chief digital officers promote the digital transformation of their companies. *MIS Quarterly Executive*, *16*(1), 1–17.

Smith, E., & Umans, T. (2015). Organizational ambidexterity at the local government level: The effects of managerial focus. *Public Management Review*, *17*(6), 812–833. https://doi.org/10.1080/14719037.2013.849292

Soe, R. M., & Drechsler, W. (2017). Agile local governments: Experimentation before implementation. *Government Information Quarterly*, *35*(2), 323–335. https://doi.org/10.1016/j.giq.2017.11.010

Stettner, U., & Lavie, D. (2014). Ambidexterity under scrutiny: Exploration and exploitation via internal organization, alliances, and acquisitions. *Strategic Management Journal*, *35*(13), 1903–1929. https://doi.org/10.1002/smj.2195

Stigler, G. (1939). Production and distribution in the short run. *Journal of Political Economy*, *47*(3), 305–327. https://doi.org/10.1086/255387

Svahn, F., Mathiassen, L., & Lindgren, R. (2017). Embracing digital innovation in incumbent firms: How Volvo cars managed competing concerns. *MIS Quarterly*, *41*(1), 239–254. https://doi.org/10.25300/MISQ

Tassabehji, R., Hackne, R., & Popovič, A. (2016). Emergent digital era governance: Enacting the role of the 'institutional entrepreneur' in transformational change. *Government Information Quarterly*, *33*(2), 223–236. https://doi.org/10.1016/j.giq.2016.04.003

TBMV (2016) *Accelerating the mission: Recommendations for optimizing federal technology cost and value in the age of FITARA*. https://www.actiac.org/accelerating-mission-recommendations-optimizing-federal-technology-cost-and-value-age-fitara

Thierer, A. D. (2016). *Permissionless innovation and public policy: A 10-point blueprint. SSRN Papers*. George Mason University.

Trong Tuan, L. (2017). Reform in public organizations: The roles of ambidextrous leadership and moderating mechanisms. *Public Management Review*, *19*(4), 518–541. https://doi.org/10.1080/14719037.2016.1195438

Tushman, M. L., & O'Reilly, C. (1996). Ambidextrous organizations: Managing evolutionary and revolutionary change. *California Management Review*, *38*(4), 8–30. https://doi.org/10.2307/41165852

Ubaldi, B., Van Ooijen, C., & Welby, B. (2019). A data-driven public sector: Enabling the strategic use of data for productive, inclusive and trustworthy governance. *OECD Working Papers on Public Governance,* (33), 0_1–59.

Uotila, J., Maula, M., Keil, T., & Zahra, S. A. (2009). Exploration, exploitation, and financial performance: Analysis of S&P 500 corporations. *Strategic Management Journal*, *33*(2), 221–231. https://doi.org/10.1002/smj.v30:2

Van Grembergen, W., & De Haes, S. (2009). *Enterprise governance of information technology: achieving strategic alignment and value*. Springer Science and Business Media.

Van Maanen, J. (1979). The fact of fiction in organization ethnography. *Administrative Science Quarterly*, *24*(4), 539–550. https://doi.org/10.2307/2392360

Weerakkody, V., Omar, A., El-Haddadeh, R., & Al-Busaidy, M. (2016). Digitally-enabled service transformation in the public sector: The lure of institutional pressure and strategic response towards change. *Government Information Quarterly*, *33*(4), 658–668. https://doi.org/10.1016/j.giq.2016.06.006

Weill, P., & Ross, J. W. (2004). *IT Governance: How top performers manage IT decision rights for superior results*. Harvard Business Press.

Wiener, M., Mähring, M., Remus, U., & Saunders, C. (2016). Control configurations and control enactment in information systems projects: Review and expanded theoretical framework. *MIS Quarterly, 40*(3), 741–774.

World Economic Forum. (2016). *Digital transformation initiative: Unlocking $100 trillion for business and society from digital transformation*.

World Government Summit & OECD (2017) *Embracing Innovation in Government*. www.försäkringskassan.se, Retrieved April 1, 2019, from. www.skatteverket.se

Xue, L., Ray, G., & Sambamurthy, V. (2012). Efficiency or innovation: How do industry environments moderate the effects of firms' IT asset portfolios? *MIS Quarterly*, *36*(2), 509–528. https://doi.org/10.2307/41703465

Xue, L., Ray, G., & Zhao, X. (2017). Managerial incentives and IT strategic posture. *Information Systems Research*, *28*(1), 180–198. https://doi.org/10.1287/isre.2016.0660

Yli-Huumo, J., Päivärinta, T., Rinne, J., & Smolander, K. (2018). Suomi.fi – Towards government 3.0 with a national service platform. In P. Parycek, O. Glassey, M. Janssen, H. J. Scholl, E. Tambouris, E. Kalampokis, & S. Virkar (Eds.), *Electronic government. EGOV 2018. Lecture notes in computer science* (Vol. 11020, pp. 3–14). Springer.

Youtie, J., & Shapira, P. (2008). Building an innovation hub: A case study of the transformation of university roles in regional technological and economic development. *Research Policy*, *37*(8), 1188–1204. https://doi.org/10.1016/j.respol.2008.04.012

Zimmermann, A., Raisch, S., & Cardinal, L. B. (2018). Managing persistent tensions on the frontline: A configurational perspective on ambidexterity. *Journal of Management Studies*, *55*(5), 739–769. https://doi.org/10.1111/joms.2018.55.