Digital service teams in government

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ABSTRACT

National governments are setting up digital service teams (DST) – IT units outside the centralized CIO's office – to respond to complex governmental and societal challenges in a responsive and agile manner. DSTs emerge as a third space between centralized and decentralized IT departments that are triggered by large-scale IT failures and the need to abandon black swan IT projects - tasks that traditional CIO offices were not able to handle so far. DSTs design principles have been replicated from the initial idea of the UK's Government Digital Service team and implemented in other countries, such as the U.S., Canada, Italy, or Finland. For this article, a qualitative interpretative approach was chosen to understand external and internal context factors that contribute to the emergence of these digital service teams. The article brings initial clarity of the composition and tasks of DSTs and extends the existing theory of context by providing insights about this third space between centralized and decentralized IT departments to organize IT Governance in public sector organizations.

1. Introduction

Digital service teams (DST) have emerged as a third space of IT governance in between centralized and decentralized CIO offices. They can be described as organizational structures that are focusing on the redesign of services and processes with the goal to provide digital government services faster and in a more user-centric way than existing e-government efforts.

Previous digital government approaches have moved from initially digitizing internal operations to external digital service delivery (for an overview of the phases of digital government, see, for example, Bretschneider & Mergel, 2011). The current status of digitalization of public services can be described as transition between modes of delivery: from analog services to multi-channel online plus additional analog services offered in parallel. This delay in comparison to private sector technology use in the provision of online services and products has been poignantly expressed by Barack Obama's following quote: "We live and do business in the Information Age, but the last major reorganization of the government happened in the age of black-and-white TV" (2011).

Several national governments have therefore started to build digital service teams outside the existing IT governance infrastructure to free up space and time to focus on the acceleration of digital service delivery – without interfering with the traditional CIO office's tasks to support the existing IT services. The academic discussion how the existing IT governance structures should be built is still ongoing and has not been conclusively resolved (see, for example, Bozeman & Bretschneider,

1986; Kraemer & King, 1986). While some authors favor centralized IT units because of their effective and efficient decision making and oversight (Brown & Grant, 2005), others promote decentralized IT departments with their own resources to cater toward individual unit's needs (Faguet, 2014).

Digital service teams that are introduced as a third space between these centralized and decentralized IT departments have not been covered in the peer-reviewed literature so far. There are only two business school cases and a practitioner-oriented publication (Birkinshaw & Duncan, 2014; Mergel, 2017; Weiss, Sinai, & Norris, 2018) and it is therefore necessary to systematically analyze their emergence. O'Toole and Meier's (2015) theoretical framework on how internal and external context factors contribute to the achievement of an organizational aim is applied here to trace the different contextual factors that lead to the emergence of digital service teams with the goal to bring clarity to the empirical phenomena of DSTs and to add to the existing literature on IT governance. The research question that this article aims to answer is: What were the contextual factors that led to the creation of digital service teams?

Using semi-structured interviews with the founders and additional team members of each of the teams, the statements were first deductively analyzed using a coding start list derived from the literature. As a next step, additional inductively derived codes emerged from the data that helped to expand the initial theoretical framework. The comparison within in each category of the initial framework across countries then shows the configurational aspects of the teams, differences among them across political systems, as well as similarities that foster digital service delivery.

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First, the article reviews the existing literature on digital government development - specifically the most recent development toward digital transformation - and combines these developments with the ongoing discussion on IT governance structures, organizational configurations, and contexts. Next, the research design approach is presented including an extended section to understand the specific context of the embedded case studies chosen for this research and the comparative approach to understand the context factors. In the findings section, the activities that lead to initial outcomes and contribute to the overall outcome of digital transformation are extracted from the qualitative interviews conducted for this study. A synthesis of the findings is presented and their impact on theory and practice is discussed in the light of the ongoing discussion of IT governance and the configuration of IT units. The article ends with a presentation of future research needs.

2. Background of the study

The implementation of digital government has been going through several policy and implementation paradigms. Oftentimes, these are tied to waves of ideological trends in public policy and public management. For example, toward the end of the New Public Management era Dunleavy, Margetts, Bastow, and Tinkler (2005) observed that digital government design elements were organizationally disaggregated: Responsibility for IT governance was given to decentralized units. Reducing government operations to their core mission led to increased outsourcing and shifts in budget incentives toward consulting and contracting out (see, for example, Diefenbach, 2009; Dunleavy et al., 2005). The result is still noticeable today: government organizations claim that it is immensely difficult to hire IT talent into government leaving government with a reduced talent pool and a diminished capacity to innovative internally (Light, 2000). Contract management activities are limited to oversight and a mere check whether bureaucratic requirements were performed by contractors, however without the internal skill set to actually evaluate whether systems work as defined in the initial set of requirements. IT governance – including decision making procedures, accountability standards, monitoring of the use of IT – was negatively affected by the distributed nature of decision making (for an overview of IT governance frameworks, see, Boynton, Jacobs, & Zmud, 1992; Brown & Grant, 2005).

In addition to these types of public management fads, the focus of most digital government initiatives is driven by each administration's national priorities. As an example, with the enactment of the U.S. e-Government act, the focus was on customer service: providing access to online government services for different stakeholder groups (citizens, businesses, and other government organizations) (U.S. Congress, 2002). The goal was to organize, preserve, and move government information online. The centralization efforts were enacted by promoting interagency collaboration and the establishment of a Federal Chief Information Officer. With the Obama Administration then came a push toward the use of emerging technologies, such as social media and mobile technologies. The notion of customer centric e-government was based on experiences during the Presidential campaign. Especially the Open Government memorandum (The White House, 2009) focused on increasing participation, transparency, and collaboration to support government's innovativeness, for example through the release of open government data and the engagement of a broader civic technology community to create innovations around open government (The White House, 2012). However, the trend toward reigning in "big government" was followed and budgets for hiring IT talent into government were pushed further. The result in today's IT operations is that contractors deliver their contractual obligations at the agreed upon time and only at that point government organizations find out whether or not the delivered product performs or if additional requirements are needed. An example is the U.S. HealthCare.gov platform – an online marketplace to match citizens with pre-approved health insurance providers in each

U.S. state. The immense complexity of creating 50 different sub-marketplaces combined with missing management oversight led to delays and even the failure to launch (Anthopoulos, Reddick, Giannakidou, & Mavridis, 2016; GAO, 2014a, b).

What is missing in the current conversation about IT Governance is how these problems can be tackled beyond an individual project level and the push to merely digitize offline processes. A few authors have suggested innovative approaches, such as adaptive (Janssen & van der Voort, 2016), anticipatory (Bertot, Estevez, & Janowski, 2016), and agile government approaches (Balter, 2011; Margetts & Dunleavy, 2013) to reintegrate digital service delivery with a holistic focus on human- and client-centered design delivered through shorter development cycles. Others favor platform approaches and open architectures (Fishenden & Thompson, 2013; O'Reilly, 2011), agile approaches (Mergel, 2016), or user-centered governance in the design of public service to create public value through the use of ICT (Clarke & Craft, 2019; O'Flynn, 2007; Romme & Meijer, 2019).

However, the task that digital service teams set out to fulfill – the digital transformation of government - is in scale and mandate so massive, that governments have chosen to establish separate units to create networked and agile IT governance structure in addition to the existing IT governance organizational units. DSTs were created to bridge the gap between traditional forms of IT governance and modern, agile or networked IT governance forms and it is therefore important to understand – among other things – the internal and external contextual factors that have led to their emergence.

2.1. Digital service teams as a result of the lack of guidance during the new public governance era

The New Public Management era has left many government operations strapped off their budgets to focus on funding internal operations, performance measurement, and as a result providing budget incentives to outsource those tasks that are not considered part of the core mission of the organization (Dunleavy et al., 2005). As we leave the NPM era and refocus on modern public governance approaches, practitioners and scholars around the world are pointing their attention to collaborative governance networks to improve innovativeness in government instead of performance measurement and bottom-line thinking (Osborne, 2006; Osborne, 2017; Verkuil & Fountain, 2014).

The current conversation about digital government focuses mostly on individual projects or general outcomes, such as transparency or public value. Studies on how a major transformation of the whole of government can be accomplished beyond single project solutions is currently missing. While the focus on understanding post-NPM public sector, emerging digital teams and i-Labs (Tõnurist, Kattel, & Lember, 2017), and on agile government is justified, these approaches come short in appreciating the task in scale and mandate. I argue that practitioners and researchers need to re-conceptualize the notion of digital transformation from an additive viewpoint (digital government adding new layers to existing services and processes) toward a comprehensive view that includes leadership, managerial, administrative, and cultural contexts at the center of the transformation efforts – and not a technology-driven revolution of government.

2.2. Digital service teams between centralization and specialization

The organization of *E*-Government activities in public sector organizations has also been subject of a long-standing debate that focuses on the decision whether IT governance should be centralized or decentralized (see, for example, Bozeman & Bretschneider, 1986; Kraemer & King, 1986). These discussions range along a continuum of centralization and decentralization of CIO offices as best options for IT governance. Centralized CIO offices have the advantage of making decisions more effectively and keeping oversight in a single organization (Brown & Grant, 2005), while decentralized IT units distribute governance

across different organizational subsections, might be able to cater toward more specialized needs of the service they are attached to. These streams in the literature have so far not dealt with the emergence of digital service teams, that usually operate as independent units focusing on high profile projects under the direction of Presidents or other types of political leaders.

3. Theoretical framework

In addition to the discussion of how IT governance should be organized, O'Toole and Meier (2015) propose to study the context of public sector organizations and their management to understand the political, environmental, and organizational context in which they operate.

Context is defined as "situational opportunities and constraints that affect the occurrence and meaning of organizational behavior as well as the functional relationships between variables" (Johns, 2006:386, as quoted in O'Toole and Meier (2015:238)). Context can be divided into external and internal context. External dimensions of context include political and environmental variables. The assumption is that public sector organizations have to by design be responsive to political demands and that their formal structure is modelled based on policy. The initiation of a digital service team will therefore be dependent on a political decision connected with the resources for staffing and operations. Public sector organizations also follow pre-defined routines in order to make sense of the complex and at times turbulent environment they operate in. In order to initiate DSTs, however, it is necessary to break with previous routines to establish the third space that has not been occupied by centralized or decentralized IT governance routines.

The internal context focuses on the efforts that are necessary to achieve organizational goals (O'Toole & Meier, 2015). A goal according to Rainey (2009) is the expressed purpose of the organization. Especially during the NPM era digital service design and delivery was outsourced to external contractors, leaving public sector organizations with large scale IT failures in its delivery and management. The goals have become ambiguous and are potentially in conflict with effective and efficient delivery of public services. DSTs might bring new goals that resolve these conflicts and align better with the mission of public sector organizations (Faguet, 2014).

In addition, hierarchy and organizational embeddedness play an important role as part of the internal context. According to O'Toole and Meier (2015), hierarchy and especially the degree of centralization will impact how public sector organizations are managing and use discretion to make decisions. It also impacts how public managers recruit and select employees to add to the mission and goals of their organization. DSTs focus on bringing new approaches into the public sector and therefore need to potentially recruit from other sectors or areas of government where digital transformation was already successful.

The last dimension of the internal context is professionalism: the more public service is seen as a profession, the more important it becomes to recruit professionals with technological knowledge into the public sector (Mosher, 1982). In the EU, demands through public policy, such as the "Tallinn Declaration on eGovernment", or the UK's digital first mission, force public managers to focus their digital service delivery on changing public demands and the pressure is increased to deliver on these changing policy objectives. For this purpose, professionals with the type of expertise needed are recruited into the public sector. This might in turn have an impact on how public managers organize and manage in innovative settings, such as DSTs. New professions and alternative career paths need to be taken into consideration and public managers might need to allow delegation of decision making to lower levels or the freedom to experiment with new approaches (Andrews, Beynon, & Aoife, 2015). In turn, it might help public sector organizations to utilize external network ties to learn from digital transformation experiences of other sectors (Barney, 2001; Nahapiet & Ghoshal, 1998).

Andrews et al. (2015) suggest that the configuration of the variables constituting the internal and external context will help to explain how public sector organizations become more effective in their public service delivery. In addition, O'Toole and Meier (2015) propose that when the contexts have parallels, the organizations might likely produce similar results. In the case of DSTs, it is therefore conceptually and empirically relevant to study these dimensions to gain a better understanding of their emergence and the approaches they chose in their operations.

The following conceptual framework shows the above outlined dimensions of the context concept that builds the theoretical foundation of this study:

For the purpose of this article, the concept of context is used as a way to explain which contextual factors have led to the emergence of digital service teams outside of the preexisting formal organizational arrangements in form of CIO offices that are traditionally responsible for IT governance issues.
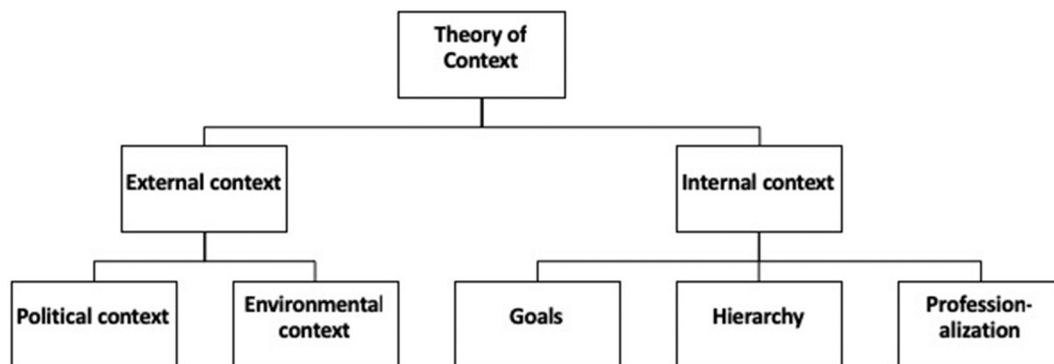

Fig. 1. Conceptual framework based on O'Toole and Meier (2015).

4. Research design

The research design uses a comparative public management approach suggested by O'Toole and Meier (2017). The resulting contingency framework allows for greater generalizability of the individual cases by focusing on the types of managerial and organizational design decisions leaders and implementers of digital service teams have made. O'Toole and Meier suggest using qualitative interpretative methods to allow researchers to extract the meaning that social actors bring to the organizational reality that is studied. Qualitative approaches allow for holistic explanations of an empirical phenomenon that has not been studied before (Haverland & Yanow, 2012).

The goal of this interpretative research design is to understand the reasons why the specific phenomenon occurred: the emergence of digital service teams. It contributes to our understanding of new modes of IT governance derived from the real-life experiences, viewpoints, and the socially constructed realities of the subjects (see, Geertz, 1973 for the epistemological and ontological posititions; Miles, Michael Huberman, & Saldana, 2014). This research design therefore does not start with a set of hypotheses, instead it aims to derive meaning from the lived experiences of the interviewed civil servants situated in their own empirical settings and contexts within in their countries. For that reason the direct interactions with the subjects is necessary to understand their rationalization processes and how they assign meaning to the phenomenon itself.

The initial research question is therefore rather broad in nature "What leads to the emergence of digital service teams?" in order stay open to different types of interpretations and meaning during the data analytical steps or "premature diagnostics", as Haverland and Yanow (2012:404) state. The more detailed research question then emerged during the data interpretation process and focuses on the specific theoretical construct of context: "What were the contextual factors that led to the creation of digital service teams?"

Next, I provide detailed information about the casing and data collection procedures, including the selection of interview partners and the data collection instrument. After that I will explain the systematic steps taken during the data analytical procedure.

4.1. Casing and data collection procedure

The data was collected from members of eight international digital service teams. These teams constitute according to Ragin (2009) cases in interpretative research – or sites or settings – that help to illustrate a specific empirical phenomenon. The data collection started with the two teams in the U.S. and additional teams were added to the data collection efforts in a snowball sampling approach (Biernacki & Waldorf, 1981; Noy, 2008). Every time a founding member told the interviewer where they had looked for expertise and practices to replicate in their own contexts, cases were added to the data collection. This approach has the advantage that rare cases can be identified through each chain referral that might only be known to the public managers' social realities, but not necessarily openly known to the general public. For each referral, the researcher asked the initial

interviewee for contact details and at times introductions.

As a result, the digital service teams included in this study are: Estonia's CIO (as pointed out by all other chosen cases as the leader in digital service practices), Denmark's Digital Agency, the UK's Government Service Team, the U.S. government's 18F and US Digital Service, the Italian Team Digitale, the Canadian Digital Service Team, and Finland's D9 team.

The chosen case study approach – of what can be labelled most extreme cases – is according to Yin (2009) an appropriate form of empirical inquiry when a "contemporary phenomenon needs to be investigated in-depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin, 2009:18). This casing strategy focused on eliciting a full sample of all existing digital service teams – at the time when the research was conducted.

The interpretative flexible research design uses field-based data to capture the insights and perceptions of the subjects (Creswell & Poth, 2017). For each of the digital service teams selected for this study, the author conducted semi-structured interviews with the founding members, their current leaders or CIOs (in the case of Denmark and Estonia) and the chapter or guild leaders between 2016 and 2018. Chapters or guilds are subunits bringing together subject area experts heading a specific domain within the larger matrix organization, for example, the engineering chapter or the design guild. The selection of the interviewees followed a purposive within-case sampling approach and was chosen to compare positions, practices, and contexts across cases (Robinson, 2014; Yin, 2013). The overview of interview partners – sorted in the order data collection - is included in Table 1.

Table 1
Overview of interview partners.

Digital service team	Number of interview partners
1. Estonian chief information office	22
2. The danish agency for digitization	3
3. Government digital service team (UK)	10
4. +5. U.S. digital service team (USA) 18F (USA)	22
6. Team digitale, Italy	7
7. D9 (Finland)	4
8. Canadian digital service team (Canada)	7

4.2. Data analysis procedure

Given the lack of existing research specifically on digital service teams, the interview questions were derived from existing literature on context in public management, digital government and its organizational design elements, press coverage about the teams, as well as their own extensive online documentation on websites, which include mission statements, policy documents, team composition, tasks, budgets, digital transformation playbooks, as well as extensive storytelling including historic development stories on team blogs. Table 2 includes a sample overview of documents used.

Table 2
Sample documents used.

#	Type of document	URL
1.	Italian team digitale's mission statement	https://teamdigitale.governo.it/en/2-content.htm
2.	Danish digital agency's policy and strategy documents	https://www.digst.dk/Servicemenu/English/Policy-and-Strategy
3.	U.S. government's 18F team composition and budget documents	https://18f.gsa.gov/about/#our-team
4.	UK's government digital service's history	https://gds.blog.gov.uk/story/
5.	U.S. government's digital service's digital services playbook	https://playbook.cio.gov/

This qualitative research approach has the goal to produce new insights from an empirical phenomenon that has not been taken up by the existing digital governance or digital transformation literature (Strauss & Corbin, 1990). The qualitative inquiry through in-depth interviews leads to additional insights on internal decision making, strategizing processes, or individual perception about managerial practices, such as hiring decisions, use of IT development approaches, or long-term digital transformation aims, which are neither observable online, nor through document research, or happen in the context of conversations and interactions among team members or with other public servants (Rowley, 2012).

The interviews were transcribed verbatim and in addition, after each interview, the interviewer took field notes from memory and identified emergent new themes or, alternatively, confirmed patterns (McLellan, MacQueen, & Neidig, 2003; Saldaña, 2016).

The coding process was divided into a first cycle of coding using the theoretical start list derived from the theoretical framework (Gioia, Corley, & Hamilton, 2012; Miles et al., 2014). During this first cycle of coding, the theoretical constructs derived from the literature were used to code the initial internal and external context dimensions. In the second cycle, additional variables inductively emerged that helped to operationalize context variables and therefore added new codes to the existing theoretical framework. After the two cycles of coding, the contextual themes underlying the creation of digital service teams were synthesized from the first two analytical cycles.

The emergent patterns are described in the following findings section, similarities and differences are interpreted and explained to understand how and why the observed patterns emerged. The result of this interpretative approach is a synthesis to identify broad patterns from across the different cases. The synthetic map of the findings is available in Fig. 2 in the findings section.

4.3. Quality criteria and limitations of the research design

Interpretative research traditions have their own quality criteria and cannot be compared with quantitative criteria, such as reliability, generalizability or objectivity (Haverland & Yanow, 2012; Ospina, Esteve, & Lee, 2018). Instead, Ospina et al. (2018) suggest six quality criteria that were considered in the following manner: (1) Clarify epistemological and theoretical assumptions: In this article, I explain in the background, literature review, and at the beginning of the research design section which theoretical framework guides the research question, the data collection strategy, and data analytical steps. The epistemological assumptions are directly derived from the original research by O'Toole and Meier and provide the conceptual framework. (2) Articulate the logic behind choosing a qualitative research tradition: Here, I follow directly the suggestions made by O'Toole and Meier who request that a qualitative interpretative method is necessary to extract contextual factors. While some factors might be publicly observable, most of the factors can only be extracted by directly talking to those actors who were involved which helps to understand their real-life experiences. (3) Explain the criteria for case selection and clarify the sampling strategy: The case criteria were explained in chapter 4.1. Here, in addition to explaining the case selection, I also expanded my explanation to include Ragin's casing procedure for qualitative research. I included all currently known digital service teams into my study and made sure that in addition to my own selection, I asked each interview partner in a snowball sampling approach to name additional interview partners. (4) Be transparent about how the qualitative data are collected, analyzed, and interpreted: The research design states the data collection, analysis and interpretation steps. The interview partners for each digital service team are listed. (5) Ensure a writing style consistent with your chosen qualitative research tradition and explore creative writing possibilities: Ospina et al. (2018) suggest here to include direct quotes from the interviews to illustrate the findings. This is a tradition that I also follow in the findings section. (6) Consider the broad range of standards of quality in qualitative research and report on the limitations of the study, which are reported next.

This study was designed to extract contextual factors that led to the initiation of an innovative form of digital service delivery that happens outside of the central CIO office or other types decentralized units that deal with IT governance issues. The initial design decisions impact or influence the interpretation of the findings and the results here focused solely on external and internal factors of digital service teams. Therefore, limitations of common qualitative research critiques apply to this study. These might include research subjectivity and resulting biases. However, careful consideration was given to the quality criteria of qualitative research summarized in Ospina et al. (2018) and applied here to account for potential limitations and to minimize their potential impact.

The presented data in this study does not reflect the performance or effectiveness of digital service teams. On the contrary, the data only reflects self-reported approaches to IT governance. Additional data is necessary to understand how government – in form of process or product owners – change, absorb and successfully replicate the suggested principles and as a result become more effective and efficient IT providers for the rest of government. The current research design is therefore also constrained regarding its transferability and generalizability to other types of IT governance organizational arrangements. Given the sole focus on digital service teams, a comparison to centralized and decentralized CIO offices is not possible at this point. For a direct comparison additional data is necessary to expand the comparative approach across different types of arrangements in order to evaluate the performance of DSTs.

The current digital service teams that were included in this study focus on a specific type of Western bureaucracy. Findings might therefore only be applicable to similar types of political and bureaucratic contexts and more difficult to apply other types of bureaucracies. By using multiple cases across different political systems, some of these limitations might be eliminated and insight cannot be transferred to other contexts in which digital service teams emerge as new IT governance mechanisms.

Certainly, the choice of the research design, the single author and coder approach bring limitations in themselves: Others might not have interpreted the data in the same way the author did. However, by providing a step-by-step guide explaining the research process and the potential limitations of this interpretative approach, provides a high-level of transparency of the choices the author has made. These limitations provide opportunities for further research to answer questions of transferability to other types of IT governance approaches that were out of the focus of the current study and expand the theoretical base of IT governance.

5. Findings: emergence of digital service teams

The findings are organized along the two core constructs external and internal context, which are were deducted from the conceptual framework and then operationalized inductively through the interviews and explanations. Each construct is then explained using contextual differences of each of the countries. A strong similarity among all digital service teams is that they are located in Western democracies, with professional bureaucracies. One exception is Estonia, with its open system bureaucracy, but clearly oriented toward professionalizing its bureaucracy (Randma, 2011). An overview of the findings is available in the appendix.

5.1. External context of digital service teams

5.1.1. Inception of digital service teams driven by the environmental and political contexts

The inception of digital service teams can be traced back to political and economic tipping points in each of the countries. There are three

different forms of tipping points that can be identified: (a) Estonia's and Denmark's inward focused reliance on its own capacities to build digital services from scratch; (b) the UK's and US' digital service teams initiated because of major black swan IT failures learning from private sector digital transformation efforts – those are large-scale IT projects which ran over budget and over time (Wu, Rose, & Lyytinen, 2011); and (c) Italy's and Canada's focus on continuous improvement of digital service delivery in response to changing citizen needs replicating the successes of the UK's and US' digital service teams.

Estonia started out with a blank slate gaining independence from the Soviet Union in 1991 (Kalvet, 2007; Kattel & Mergel, 2018). Without any significant natural resources, the government made the decision to focus on the already existing IT industry and avoid mistakes that other countries have made: a clear decision was made not to invest into Western 'legacy IT', stay frugal and built software that fits the country's needs, resulting in the technological and organizational data exchange layer, X-Road. From then on, IT was seen as a national asset and not a product that needs to be bought from Western vendors. In a similar approach – even though not focused on 'crazy IT ideas' as Estonia, Denmark's decision was to build its own inhouse experimentation lab (MindLab) and a Digital Agency to develop digital services for the whole country, as one of the former director's explains:

"The government back then acknowledged that we in Denmark, needed to do something differently if we wanted to adopt the digital agenda and to digitalize the whole of the public sector. [The] Ministry of Finance had concluded that we needed to put people together, work closer [together], to build shared infrastructure, if we should be more digitalized with our citizens, that we needed to take a kind of a bold new [approach], too. [The Ministry] decided to do a digital taskforce where 25 young people were put into a room - mainly young people from different ministries. Some of us came in directly from the street. I was one of them, hired by the Minister of Finance. So, a team of 25 rather young people were put together and said 'okay, you now got 3 years to try to come up with ideas of how to go forward and actually also to build some of these new technologies.' We realized then in 2011 that we needed actually a whole agency to go forward with that strategy. Should we succeed in building that, we needed a full agency. So, we actually took different parts of other ministries and pulled them together, and built this new agency. And I was then put in head of that agency."

Quote: Director, danish digital agency, Denmark

In the UK, the Government Digital Service team was created in 2011 at a time when the country was still in a deep financial crisis, austerity measures were not leveraged as anticipated, but at the same time a coalition government was in place that agreed on a shared political direction to respond to external requests for improved digital services and internal major "scandalous" IT failure, and a civil service that was '*thoroughly fed up with their IT*'(Quote: former GDS leader). With a strong civic technology community outside of government, early ideas have emerged that led to the initiation of GDS. It was located in the Cabinet Office and politically backed by then Cabinet Minister Francis Maude and the UK's digital inclusion champion Martha Lane Fox, who had provided input to policy makers (Lane Fox 2010).

A parallel situation occurred in the U.S. federal government: former President Obama's signature health policy project HealthCare.gov failed – a failure that can be traced back to failure in management oversights and overreliance on 550 subcontractors to build an online marketplace for each state (GAO, 2014a). The decision to build a digital service team was made and funded by the White House as a result of a clean-up effort of HealthCare.gov for which a so-called "SWAT team" was temporarily hired to fix the website and then later institutionalized as USDS and 18F – both regular government entities.

In Italy and Canada, the tipping points were not seen as major IT or acquisition failures, instead their inceptions were based on the observation that the current IT systems – while they work – might not be

sustainable or able to fulfill changing citizen requirements and were therefore in need for future upgrades. These were stated, for example, in the public mandate letter from Prime Minister Justin Trudeau to the President of Treasury Board, Scott Brison, and the Italian Senate's budget instructions for the implementation of the digital agenda (Senato della Republica, 2016; Trudeau, 2015). During their inception period, both countries worked closely with GDS, USDS, 18F and replicated practices, principles, and approaches observed in Estonia.

This type of organizational mimicry of a current management fashion in digital service delivery occurred across inter-organizational boundaries, political systems, and countries (Abrahamson & Fairchild, 1999; Hansen, 1999). While the public sector is usually seen as independent of competitive pressures – especially when it comes to relatively independent public management or organizational design decisions on the country level (Frumkin & Galaskiewicz, 2004), what is observable in the case of digital service teams, is that there is a strong from of organizational learning from similar cases as the following quote shows:

We started with strategy. It's hard to get a group of people to agree on the vision right away. What we all could agree on, which was borrowed from the UK government's digital services, was that *delivery was the strategy*. It would be high-quality, rapid delivery of great services. If we could do that, we would solve all sorts of other problems.

Quote: Co-founder 18F, USA

Similarly, the Canadian government stated in its 2017 budget, that the newly founded Canadian Digital Service is based on experiences made by USDS/18F and GDS:

Informed by similar initiatives in the U.S. (the U.S. Digital Service/ 18F) and the United Kingdom (the Government Digital Service), the Government will adopt new ways of serving Canadians. Better use of digital technologies could improve the ways in which businesses can access government services, speed up immigration processing times through better-integrated information, or make it easier for Canadians to access benefits or tax information online.

Quote from the Canadian budget: Government of Canada (2017)

However, ideas and practices are edited and adapted as they travel across countries and organizational boundaries and are subsequently translated to the local contexts in a mimetic process (DiMaggio & Powell, 1983). As one of the Canadian interview partners highlights, each country has to find their own way, adapt their team to the country's standards and culture of government:

We've tried to internalize ourselves. Part of that is of course, bringing it into the Canadian ethos, and the way the public service here functions, if I can call it like the Canadian sort of public sector personality, such as there is. Because we are built a little bit differently from the other organizations, you know, we don't sit in, you know, USDS's proximity to the White House and their access effectively to right up to the Chief of Staff and the President, and their deployment very deliberately to top administration priorities, starting with Healthcare.gov, was one particular mode of deployment. GDS had both projects plus standard setting plus cost controls in one place. We are not constructed that way. So that means we've had to tailor, we both absorbed, but also tailored the way we're work, because we are more of a voluntary mechanism, which means we have to have a different kind of relationship with departments in the work we take on, and how we bring them along and work hand in hand with them to get to a solution and to that application of the best methods of Agile and design and user centrism and all that, because we don't have the same sticks if I can that, for lack of a better term.

Quote: Canadian digital service team founding member

The above quote shows that the local context in form of

organizational design, organizational embeddedness, but also the team's mandate and public sector self-conception had to be taken into account when adapting practices from other digital service teams. While the general frameworks and ideas can be easily adapted and lead to a seemingly convergence across the teams, professional standards and preexisting local practices play an important role toward the acceptance of local digital service teams (Powell, Oberg, Korff, Oelberger, & Kloos, 2016).

The Commissioner of the Team Digitale, Italy, explains his similar practices, but that there is also not one golden standard that all other digital service teams are adopting:

> We're doing benchmarking: We're looking at what the U.S. has done, we're looking at what the U.K. has done, obviously Estonia, which hit the jewel of the crown for everybody in that direction. And we tried to understand in great—but *the single perfect model doesn't exist*, right, so we tried to take bits and pieces that we know work from others. But the hard part is obviously adapting to their… I mean many times we need to change the laws in Italy to make a few things happen.

<div align="right">Quote: Commissioner team digitale, Italy</div>

In Finland the idea to focus on digitalization came when a new minister entered the office and was not able to find a centralized repository of all digital transformation efforts. In 2015, the government commissioned the "Digitalization: Ready for a digital spurt" report to investigate the digitalization and productivity potential in government. The report found resulted in 1024 development suggestions based on 48 interviews in agencies which resulted in seven main recommendations to digitalize services in order to become more agile, flexible, and fluent in public service delivery (D9, 2016). The report has then led to a consensus among the ruling political parties to establish the D9 team.

Political leaders responsible for the inception still serve as "… *the flak jacket for the rest of the team*" and provide „*political air cover*" for the teams in cases when they are tackling unpopular decisions or are publicly criticized for not operating at a faster pace or larger scale (Committee on Oversight and Government Reform, 2016). This allows the teams to take risks in a protected environment beyond a civil servant's regular bureaucratic discretion (Scott, 1997).

5.1.2. Corporatization: Appointing team leaders from the private sector

With one exception, digital service teams are led by private sector executives bringing in new capabilities and skills that have been standard operating procedures in the IT industry since the 1970s but have not diffused in the public sector.

As an open system bureaucracy, Estonia has a history of free exchanges between the private, non-profit and public sectors. Strategic advisors, ranging from CEOs of Skype, Nortal to Cybernetica, are providing advice to parliament or to the Prime Minister, and are also involved in delivering solutions, such as X-Road. Routinely, they take on key positions in government, such as Taavi Kotka, former Managing Director of Nortal, who has served five years as one of Estonia's most prominent CIOs and now serves as advisor to the European Union. Other government officials in turn serve as advisors to private sector companies, some of which of signed MoUs, so that a company can take for example the head of the Ministry of Finance on as an advisor while implementing software for foreign governments.

The other digital service teams have replicated this trajectory by appointing leading private sector digital transformation experts as directors, commissioners, or Executive Directors. GDS has appointed Mike Bracken - a former director of digital development at UK's newspaper The Guardian – who served as the Executive Director of Digital in the Cabinet Office, and as the first head of the Government Digital Service (GDS, 2011). USDS appointed Mikey Dickerson - a former Google engineer – as its first commissioner; 18F was founded by the first class of

Presidential Innovation Fellows, who mostly hailed from the private sector (McFarland, 2017; Wong, 2015). Italy hired Diego Piancentini – a Vice President at Amazon.com responsible for building up Amazon's international markets – as Extraordinary Commissioner for the implementation of the digital agenda (Amazon.com, 2016), which led to a public exchange between former Prime Minister Matteo Renzi and Amazon's CEO Jeff Bezos on Twitter (see Figs. 1-2, appendix 2). Finland appointed Nissa Nissilä with a background in financial services and banking as its Chief Digital Officer. Canada's Digital Service Team has appointed an interim leadership team hailing from within the Canadian government, the US and UK governments, and is currently looking worldwide to hire a new CEO. As the secretary of the Treasury Board states:

> In the past few months, I've spoken with digital service leaders around the world about what works and what they've learned. I've come away with a strong belief that the right leader for this role has a track record of shipping digital products and services that make a difference in people's lives. They are an exceptional team-builder and creative partner, with a laser-like focus on implementation – and the ability to execute on their vision.

<div align="right">Quote: Secretary of Treasury Board (2017), Canada</div>

While this practice seems to replicate some of the highly criticized practices of the New Public Management paradigm, the teams did not aim to 'run government like a business' or to implement 'NPM 2.0.' Instead, the teams are equipped with a relatively large budget, independent hiring authorities, and aim to run their teams like a start-up operation inside of government (Hoch, 2017). As a result, bottom-line thinking or performance management are initially not part of their strategies. The goals are to bring in software development and human-centered design practices that have become the industry standards in all other sectors, but have not made their way into the private sector.

5.2. Internal context of digital service teams

5.2.1. Goals of the overall implementation vision

The goals of digital service teams generally focus on advancing digitalization efforts in public service delivery. Initially, DSTs aimed at digitizing existing analog services into digital services. Especially older teams, such as GDS developed principles like digital first, where public servants were asked to think about process redesign from a digital standpoint first. Other teams that started later learned from the early success of GDS and developed their strategies and aims on expanding those goals.

As an example, the U.S.'s USDS and 18F teams focused on transforming critical services by allowing themselves to rethink how government buys digital services, but also used user-centric design approaches to establish a digital mindset with each internal user they collaborate with. Similarly, Canada and Finland focus on human- or customer-centric approaches. As one of the interview partners from D9 explains their goals – that go far beyond merely digitizing existing public services:

> "I think we have turned the mission into first of all looking at digital transformation as a wider phenomenon of changing the culture and the way things are done, the processes, and kind of transforming the entire public sector."

<div align="right">Quote: Interview partner, D9, Finland</div>

5.2.2. Hierarchy through centralization and organizational embeddedness

Much of the growth and acceptance of digital service teams needs to be attributed to the fact that they are located high up in each national governments' hierarchy and their embeddedness either directly as an independent unit under the umbrella of the President's executive office,

as an agency with their own budget, or within the treasury or finance ministries with their own budgets.

As one of the founders of the GDS team put it:

So, you're in the prime minister's office, and you're very small, very central and in a system where the center is very well actually powerless, because most of the stuff is done by departments. You're in the strongest part of the center.

Quote: Former director, GDS, UK.

Each team is equipped with their own budgets – either set for a certain number of years or on a rolling basis – to spend based on their needs. Budgets range between Euro 15 million per year to Euro 64 million per year with the authority to spend outside of the existing centralized or decentralized budget decisions for legacy IT projects.

5.2.3. Professionalization through approaches, principles, and innovative HR policies

5.2.3.1. Approach I: agile IT acquisition practices. Given the above-mentioned principles and the divergent practices between government and private sector IT acquisition practices, Digital Service Teams are influential in rethinking how government procures IT. The practices range from close review of existing contracts, to educating and training those responsible for purchasing IT in agencies in adopting private sector practices, to in-house building of prototypes and sometimes even full products.

Agile acquisition practices have been part of Estonia's strategy early on given the government's close contact to high-profile private sector IT advisors who brought the purchasing practices into government. In other countries, build-vs-buy decisions were introduced and purchasing agreements were adapted to reflect standard practices in the software industry, such as avoidance of „closed contracting" to allow for changes in requirements during the development phase, proof of concepts and prototyping competition to show that a vendor actually has the expertise to deliver and to avoid future surprises at delivery (Mergel, 2016). The following quote highlights how DSTs replicate their practices and train or advise their agency counterparts to adopt new purchasing practices:

Our team worked with them to really sort of understand the, the pitfalls that we fell into along the way, and to help them understand what would help that be successful.

Quote: Founding member 18F, USA

The small size of DSTs in comparison to the overall size of the public service, capacity to be involved in all IT decisions in government is limited. The Canadian Digital Service made it part of their overall delivery strategy to tackle projects that are largely replicable across the civil service:

How do we find projects where we can build something to address a pain point that one department's having, but it might be very likely something that a number of different departments are having, or other jurisdictions are having. Whether they be provincial governments, or municipal governments, or internationally. And so I think our goal over time is, we're publishing our code on GitHub, we're making sure kind of all the key artifacts from our work are out publicly, that other jurisdictions can actually relatively easily replicate the solutions we're developing, and adapt it for their own needs.

Quote: Founding member, Canadian Digital Service, CDS

5.2.3.2. Approach II: human-centered design and development. DSTs work in close collaboration with agency-level product owners or process owners. The interdisciplinary teams include experts provided by DSTs, such as design thinking, development, or acquisition experts, who then include those with the core knowledge about the processes or administrative acts to collaborate with them on a redesign or co-

design of a process. One of the founders of 18F in the U.S. explains the team approach:

We do a lot of pre-work to make sure the client understands how we work, why it's important, what they're signing up for, even the fact that we are gonna need a stakeholder that's involved from day one and showing up to our sprint reviews and our sprint planning meetings. We work pretty hard to just make sure that folks understand why we work the way that we do.

The main approach used is human-centered design and development – in which the end-user is at the center of all considerations and therefore has to be included in the process. End-users in government are however not only citizens, but also civil servants who have to use the services at the backend or services are designed for internal use. GDS in the UK has famously framed the phrase "Civil servants are users too" as a reminder for DSTs to consider administrative burden of digital services not only for citizens but also for civil servants (GDS, 2015).

The focus of the users in mind is also replicated by the Team Digitale that aims for simplicity in their digital service design, so that government interactions with its many stakeholders can be improved. While the policy mandates might not change, DSTs use the opportunities the Internet provides in combination with human-centered design approaches to create digital services that can be quickly adapted to changing user needs or upgrades in technology, as one of the first GDS employees explains:

It's the deployment of the platform of the internet, that we build services that are able to iterate as we discover, or as user needs emerge. But also with an agility or nimbleness, that the internet allows. And that's really all it is. If you look at the services, government is policy driven. Our mandates come from the governments of the day, as it is held to account by parliament. Those processes haven't changed. So, we get our mandates to create services in the way that we always have, right? The people elect the government, the government of the day sets policies, those policies dictate what services go on, [we] will go on to provide. How we provide those services, so that they meet the intent, is what digital has allowed us to update and upgrade.

5.2.3.3. Approach III: implementation principles. In most of the countries the political systems do not allow for a 'whole government' mandate toward the implementation of a digital agenda. Instead, initiatives, like Digital Service Teams, that are conceived at the top need to find buy-in from other levels of government. As a result, the central or federal governments examined in this study use digital governance principles that are not mandating other levels of government by law to move the digital agenda forward, but are agreed upon as sensible. These principles guide the overall vision and day-to-day decision making and are interpretations of the political mandate.

Mission aspirations are formulated toward a common goal to improve the interactions between government and its stakeholders through digital means (including citizens, businesses). As an example, in some countries, most remarkably in Denmark, even large-scale signature projects are not mandatory by law:

Some of the solutions we have built over time have never been done mandatory. For instance, our ECID, the digital signature that we are using in Denmark, isn't actually put into a law. It's not a law-based solution.

Quote: Former Director Digital Agency, Denmark

Similarly, Estonia's open system bureaucracy supports the new digital governance principles the recent CIOs brought into government, allowing them to rely on agreed upon principles, rather than formal rules and policies. As an example, Estonia's *The Once-Only-Principle* was designed so that citizens have to provide their data only once to government, so that other agencies can reuse the information and administrative burden is reduced:

Yeah, so, lots of principles. Like, this famous Estonian The Once-

Only Principle. It's not a law. People think it's a law, it's not a law, it's a principle. So, there's no like law saying that the government can ask only once information from the people. About the compliance it's a law, but about the people it's a principle. Or the saying that an ICT system has to be interoperable with other systems. Again it's a principle. There is no legally binding regulation.

Quote: Former Government CIO, Estonia

Especially in the UK, digital first principles were adopted from the media industry. The practice has emerged in journalism newsroom, where with the advent of the Internet, publishers and editors started to make the decision to post news online first, before they are feeding them into the traditional channels. The UK was one of the first to adopt this approach and other digital service teams took notice:

No, we didn't look very much to Estonia actually at that time. It just came at a later point where we started to have discussions with them. We looked at other Scandinavian countries; very much to the U.S., the U.K. also had a very interesting at that time was the both the U.S. and, and also the U.K. were very good at formulating strategies. They were not very good at implementing them. Actually, very poor at that. But the idea of *digital-by-default* came from the U.K. They have never succeeded in doing it, but they set, and we actually copied that idea.

Quote: Former Director Digital Agency, Denmark

The original idea focused on moving pieces of information on a web platform fast and then write up longer – presumably better researched – articles for the paper issues of a newspaper. In government, the Digital First principle means to design online services as the main service channel, instead of designing paper-based administrative acts. Digital First was suggested by Fox and Martha (2010) in her report to the Cabinet Office Minister. The principle has evolved in different digital service teams into mobile first approaches or digital-by-default principles (Corydon, Ganesan, & Lundqvist, 2016).

Other principles include the "No legacy IT" and open source principles. DSTs recognize that they can't tackle all existing IT infrastructure in each other their countries, but commit not to add to the existing legacy IT system and work with more light-weight solutions that already exist in open source format:

You should see the millions, the tens of millions of codes that are still written in Cobol. You can't do much about it. You cannot migrate every single software. And therefore, this government is such a complex machine, that we always see at any point, technology of all kinds.

Quote: Commissioner Team Digitale, Italy

5.2.3.4. Approach IV: HR policies to bring new skills and competences into public sector organizations. The approaches and principles promoted to push digital transformation of government service delivery oftentimes requires new skills and competences that are not or no longer available in most public administrations. During the NPM era many tasks related to design and production of digital services were outsourced to IT service providers. Which has led to a 'bleeding out' of core competences necessary to understand what users need and the skill sets to accomplish a change in the current practices to implement the mandates of digital service teams.

Similar to the already mentioned push to bring in leadership with digital transformation skills from other sectors, the staffing of digital service teams oftentimes also requires to hire team members with skills

that are oftentimes not even listed in HR categories. In order recruit and then later onboard those types of team members, HR policies had to be aligned with the changing needs in the taskforce. One example is the U.S. government's talent act of 2017 (U.S. Congress, 2017) that allows government to hire Presidential Innovation Fellows "to encourage successful entrepreneurs, executives, and innovators to join the government and work in close cooperation with government leaders to create meaningful solutions that can help save lives and taxpayer money, fuel job creation, and significantly improve how the government serves the American people. "Among people recruited under the Talent Act were for example UX designers, but also entrepreneurs with experiences running their own technology start-up companies in Silicon Valley or nonprofits, like Code for America.

Other countries did not have to go to that length in order to recruit talent: Estonia's open system bureaucracy allows regular switching between careers in the private and public sector. The country's Skype founders regularly serve as IT advisors to the President. Denmark focused its recruitment for an initial digital task internally on 25 young civil servants from different ministries who were willing to experiment as part of the Digital Agency for a period of three years.

Italy, however, left Diego Piacentini a free hand to recruit and hire the people needed by providing him with the highest hiring authority in government, as he states in the following quote:

So, the previous prime minister, was very, very interested in driving this transformation, realized that it couldn't be done with the normal agency they had with the normal processes, and asked me if I wanted to lead this, call it special taskforce. This is why my team exists, and this is why the role of the commissioner, the reason it's being called commission is simply because it gives me special powers, and I could hire people without going through the normal processes, so I could hire real experts. I created this team of 20 people, and now we're gonna hire 4 or 5 more, that's now 25, and we're trying to change things this way.

5.3. Summary of findings

In summary, digital service teams emerge based on similar developments in their external context variables. Their initiation is generally pushed by a tipping point observed from the external context: either the pressure of users to get access to effective and efficient public service in analog and digital form, or political agendas of innovative political leaders. However, independent of the local political context, the majority of political leaders have chosen DST leaders hailing from the private sector – this form of corporatization shows that the political pressure and decision making from the top is necessary to bring new skills and competences into the public sector.

The internal context factors are similarly replicated across the countries and then adapted to their local context, resembling in their principles and approaches. DSTs work with goals that aim to improve digital service delivery for internal and external users of government services. They chose signature projects that address some of the most pressing issues and work toward professionalization by bringing in talent with skills and competences that were either never available in public sector organizations or outsourced during the NPM era.

Fig. 2 shows the extended conceptual framework of context variables for digital service teams – highlighting in grey the operationalized variables that were emerged through the research processes and are added to the original framework.
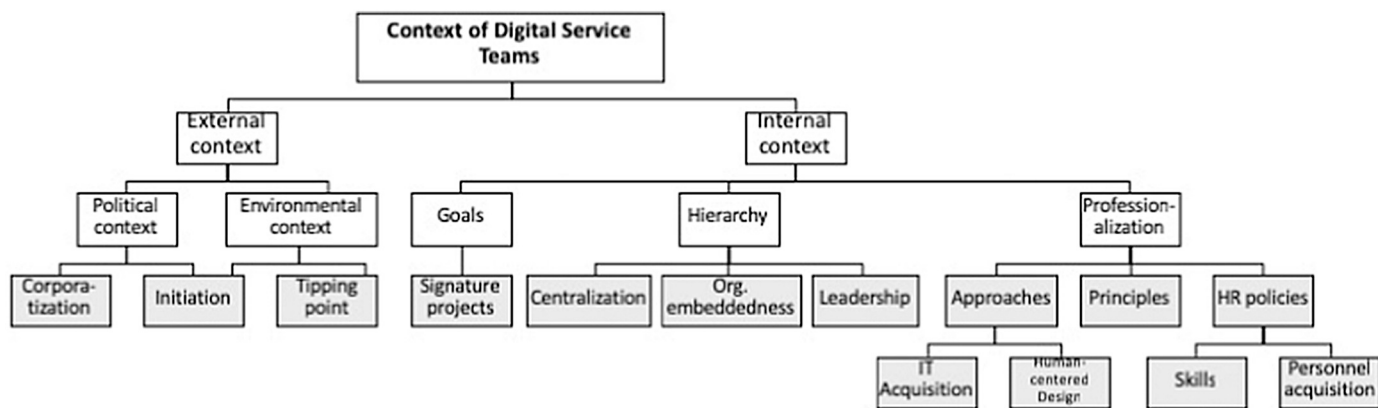
Fig. 2. Extended conceptual framework for the emergence of digital service teams.

6. Discussion: toward a theory of digital service teams' contexts

The aim of this study was to explain - in a comparative manner - the context factors that lead to the emergence and implementation of digital service teams as a third organizational design practice between centralized and decentralized IT governance units. While centralized CIO offices tend to make more efficient decisions, decentralized CIO offices tend to act in a more needs-based manner. Nevertheless, large-scale IT failures have occurred during the NPM era and digital services are lacking behind in the speed and user-centric manner that can be observed in the private sector.

The contextual factors extracted in this analysis show, that digital service teams have the ability to close some of the gaps that emerged through traditional notions of IT governance and are providing services that other forms of IT governance units have not provided in the past.

While previous waves of IT governance have focused on downsizing and streamlining IT governance (Brown & Grant, 2005), the findings highlight that IT governance needs to solve emergent problems of digital transformation of government and move toward a digital service provider on its own or with the help of external IT service providers. This reflects previous research published for example by Dunleavy et al. (2005) and other NPM critiques. The findings highlight that IT governance implementation delayed or oftentimes made digital transformation of public services impossible. The emergence of DSTs therefore needs to be viewed critically as a starting point of a new IT governance paradigm that focuses on openness and user-centricity:

Proposition 1. Digital service teams provide more centralized decision authority for innovative IT practices than previous IT governance mechanisms and can therefore become more effective in implementing digital transformation practices.

The analysis of the qualitative data shows that DSTs are replicating once developed practices that have been proven successful in other countries and are adapted to local contexts. Recent teams are able to avoid some of the early mistakes that other teams have made and are even hiring personnel and advisors from those teams to help during the strategizing and setup phases. O'Toole and Meier (2015) suggest that when the contexts have parallels, the organizations might likely produce similar results. What emerged from the analysis of the different types of context factors is indeed that similar external context variables

lead to replicated practices as part of the internal context. However, the data used for this study are not suitable to make any statements about the performance of digital service teams.

Proposition 2. The more duplication of practices is developed across digital service team, the higher their impact and the more likely is the adoption of similar practices in comparable contexts.

What these findings also mean is that while DSTs clearly fill a gap that emerged through the organizational failures of existing IT governance structures, it is important for researchers and practitioners to consider the following questions: How can DST's practices be scaled up and be moved into the standard operating procedures of existing CIO offices? Should a third space exist in addition to the already established IT governance structures or can the teams be integrated and as a whole deliver digital services in a more effective and efficient manner? Moreover, are third space IT governance units sustainable over time – especially when they might not be well integrated into the existing IT governance structures? DSTs therefore need political back-up and long-term funding to be established as true alternatives to the existing CIOs offices in order to be accepted and to scale up their practices at all levels of public administration:

Proposition 3a. The greater the degree of formalization of digital service teams, the higher the ability to scaling up operations, approaches, and practices and their integration into standard operations procedures.

Proposition 3b. The greater the degree of formalization of digital service teams, the greater the likelihood of standardization of the use of new technology and subsequent digital transformation implementation.

Formal criticism from within government also reflects that innovative practices brought into government by digital service teams are not always perceived as advantageous. As an example, in the US, the Congressional Committee on Oversight and Government Reform (2016) conducted a hearing to understand how 18F and USDS can avoid repetitive work and include agency-level CIOs into their processes. Criticism occurred mainly from lobbyists of the professional service industry who claimed that government should not enter the business of government innovation and leave innovating government services to the private sector. Congress members nevertheless confirmed their full support for the digital service teams. Similarly, in the UK the National

Audit Office (2017) attested that "Digital transformation has a mixed track record across government. It has not yet provided a level of change that will allow government to further reduce costs while still meeting people's needs." At the same time, the report highlights that GDS had an important impact on the promotion of new approaches and the development of previously lacking expertise. In order to justify future budget appropriations and hiring, digital service teams need to measure their impact and show how they impacted institutional change.

Proposition 4. As organizational change accelerates, the greater the likelihood for the adoption and standardization of innovative practices, the lower the degree of technological failures.

In conclusion, digital service teams are one current way that governments are aiming to speed up the transformation of digital service delivery to meet changing user needs and the changes in technology. Their organizational design and behavior are emulated across countries and adapted to the local context they serve in. The existence of the teams and their use of business standards is not necessarily indicative of their success. In order to assess whether they are indeed providing sustainable change and are enabling civil servants to adapt their own practices, additional research is needed that compares practices and impact of digital service teams to other decentralized or centralized IT governance mechanisms.

7. Implications

7.1. Theoretical implications

Digital service teams are introduced here as a third space between centralized and decentralized CIO offices in government. This articles adds a new dimension to the ongoing discussion on whether one type of IT governance is more advantageous than other forms (Bozeman & Bretschneider, 1986; Kraemer & King, 1986). Here digital service teams are introduced as new form of organizing and implementing digital transformation that have not been considered in the literature so far. By initially defining and then explaining the context in which digital service teams emerge, this new IT governance structure can be considered when studying the performance of different forms of digital transformation implementation in government.

The combination of external and internal context factors highlights how especially changes in the external context lead to changes of internal organizational practices and the emergence of digital service teams. O'Toole and Meier's (2015) initial framework of context in which public sector organization operate was expanded and the existing high-level categories are operationalized using additional codes that emerged from the qualitative data. The framework however did not consider the performance of digital service teams – an issue that future research needs to tackle.

7.2. Practical implications

The cases chosen for this study focus on the existing digital service teams in government. There might be many similarly operating units, that do not have the formal label or team structures as the ones included in this study. However, existing CIO offices might be able to adopt some of the functions and approaches of digital service teams.

In contexts where large scale operational failures in IT delivery need to be solved, smaller, independently working units have shown to be more agile and can perform higher than the traditional CIO office. Public managers who are rethinking the way that their IT governance structures are organized can use the findings here to redesign their own teams, provide them with competences necessary for future digital transformation projects.

Especially in the current context, where many government units are preparing the transition from analog to digital services, the freedom to experiment and to allow public servants to rethink the way that their processes were designed can have a major impact on the design of digital services. Future teams developing digital transformation practices can emulate many of the existing standards set and replicated across countries. Among those are for example service design standards, advances made in digital first or once only principles.

8. Future research questions

This article laid a first groundwork for the study of digital service teams by providing the contextual factors of their initiation and their current modes of operation by explicating their principles and approaches. By including the full sample of existing digital service teams, a theory of context was expanded with factors operationalizing the initial dimensions set forth by O'Toole and Meier (2015) that are specific to the empirical phenomenon of digital service teams. What was not part of this work was however an evaluation of whether these teams are performing more efficiently and effectively than other types of IT governance units. Future research can therefore focus on performance metrics and comparisons between the three types of IT governance modes (centralized, decentralized, and digital service teams).

Digital governance research has focused very little on user satisfaction and new forms of co-designing digital services together with citizens. While these types of co-production practices have become standard in other public administration domains, such as social services, waste management, such as recycling, there is very little to no research available on the co-design of digital services with its users. Digital service teams have heavily adopted design thinking processes and include co-design approaches with internal and external users. Additional research can therefore focus on how satisfied users are when they are included in service design and whether co-designed services are indeed adopted by users at an improved scale than traditionally designed services without user involvement.

DSTs are at times labelled as catalysts for change and their methods and approaches can be compared to those of innovation labs or living labs. These, too, are service units that focus on bringing new skills to oftentimes digital service delivery in order to provide more innovative service and most of all co-design them with citizens or other types of users (Tönerist et al. 2017). The research on these types of innovation catalysts (Majchrzak et al. 2018) is slowly progressing but has barely reached the public administration or IT governance literature yet. Future research should therefore focus on how these types of innovation units produce innovations that move from these experimental and lab-like organizational forms into standard operating procedures of public sector organizations and thereby introduce lasting organizational change on IT governance routines.

Further research is required to study the organizational design elements, the approaches toward digital transformation, the competences need in government, the leadership approaches by private sector executives moving into IT governance units in the public sector, and the outcomes of digital service teams in delivering digital transformation approaches to government.

Acknowledgements

Appendix 1

Appendix table
Contextual matrix of digital service teams.

Country	Estonia	Denmark	UK	USA	Italy	Finland	Canada
DST's name	Central CIO office	The Danish agency for digitization	Government digital Service (GDS)	18F & United States digital service (USDS)	Team Digitale (TD)	D9	Canadian digital service (CDS)
Founded in	~2004	2011	2011	2014	2016	2016	2017
Budget	Large-scale digital government projects are mainly funded by structural funds	DKK 12 billion for improvements of public services among them digitization efforts (2014–2020)	£58 m/year + £450 m additional funding awarded in 2016	Loan of $30 m from GSA's Acquisition Services Fund (operating a loss; expected to generate revenue & cost recovery)	Euro 31 m for setup year 2017–2018 budgetary and accounting autonomy Euro 9 m from the 2014/2020 Structural Funds	Euro 100 m for digitalization of government services	CAD 25 m for initial three years
1. External context of digital service teams							
a) Political context							
Political context	Parliamentary republic	Parliamentary representative democracy	Constitutional monarchy	Federal constitutional republic	Constitutional republic	Parliamentary democracy	Parliamentary government, constitutional monarchy
a) Initiation	Former Prime Minister Mart Laart, 1992 with support of strategic advisors	Internal ideation process – young technologists designed and implemented the idea backed by Ministry of Finance	Former Cabinet Office minister Francis Maude; Martha Lane Fox, Digital Inclusion Champion, UK Government	Former President Barack Obama	Former Prime minister Matteo Renzi	Shared initiation by political parties	Through mandate letter from Prime Minister Justin Trudeau to President to Treasury Board Scott Brison
b) Corporatization of leadership	Civic technologists from banking industry convincing political leadership to invest in CIO position from the private sector Taavi Kotka (2013–2017) Siim Sikkut (2017-present)	First director Lars Frelle-Petersen from Ministry of Finance (2011–2017)	First director: Mike Bracken from The Guardian (2011–2015)	First Commissioner, Mickey Dickerson, hired from Google (USDS) Founding members were the first Presidential Innovation Fellows, Current 18F leadership from Pixar	Extraordinary Commissioner for the implementation of the Digital Agenda, Diego Piacentini, hired from Amazon for initial two-year term to start implementation of three-year plan	Chief Digital Officer Nina Nissilä with previous experience in private sector (banking)	Founding members from within Canadian government: Ryan Androssof, Senior Digital Advisor to the Canadian Government, Anatole Papadopoulos, Executive Director (CDS)
b) Environmental context							
Tipping points	Economic development "Cut the ties" IT national asset No other natural resources or existing industries	Digitization of the whole public sector in collaboration with Ministry of Finance, all municipalities and regions on the state level	Financial crisis Coalition government	Massive public failure of signature HealthCare.gov platform - tackle the federal government's most critical public-facing digital services; swat teams needed for fast rescue of national priority projects	Lack of project management Digital projects not seen as continuous programs	New minister who aimed at consolidating digital transformation approaches; solicitated report about the status of digital transformation which was then picked up and used as starting point	Need for improved digital services Review of developments in UK and US to identify new organizational forms

Appendix table (*continued*)

Country	Estonia	Denmark	UK	USA	Italy	Finland	Canada
DST's name	Central CIO office	The Danish agency for digitization	Government digital Service (GDS)	18F & United States digital service (USDS)	Team Digitale (TD)	D9	Canadian digital service (CDS)
II. Internal context of digital service teams							
(a) Goals							
a) Aims	Centralized of data on a shared data platform; Once-only principle; Layered approach of software development; Collaboration between private & public sector	Scaling up by building shared infrastructure	User-centric approaches Simplification of access Cultural change of mindset of outsourcing of technology Reduction of fraud	Transforming critical services; Rethinking how the Government buys digital services; Expanding the use of common platforms, services, and tools; Bringing top technical talent into public service	Value existing technological assets; we will not rebuild what already works; Simplification; Mobile first approach	Support digital transformation from a human-centered standpoint; accelerate the reform of government services so they become customer-focussed services that utilize digitalization	3 Rs – Readiness – Reach - Replicability
b) Signature projects: "Killer application"	eID XRoad *E*-Voting Online tax E-Residency Digital Embassies	Digital ID (ECID) E-invoicing	GOV.UK Login.gov	Project- and agency-based: Agile acquisition (BPAs) Design standards	PagoPA (centralized payment platform) eID	Migration office's chatbot	Not yet defined
(b) Hierarchy							
a) Organizational embeddedness & centralization	Ministry of Economic Affairs and Communication	Ministry of Finance	UK Government Cabinet Office	White House & General Service Administration (GSA)	Department of Public Function	Ministry of Finance's State Treasury	Treasury Board of Canada Secretariat
(c) Professionalization							
a) Approaches	Cutting edge and radical (on purpose) transformation toward "Country as a Service" approach Branding – pushing the boundaries	Inward orientation Built in-house innovation lab (MindLab) to experiment & test digital services before they are built for broader use Scaling up of digital approaches: After that, buy-in and co-funding from regions and municipalities	"Nothing to lose" Civic technologists forming digital agenda "Government as a Platform"	"Fail, fail fast" – startup culture in government Human-centered design Agile innovation management	Leverage open source technologies Follow modern design patterns Data driven Open about mistakes and accomplishments Become authoritative center of digital and innovation competence Long term vision with intermediate milestones Continuous learning	"Customers First": Design Thinking approaches for all concerns and problems that teams might have to fulfill their mission; empathy in design	Deliver solutions Build capacity Provide advice
- IT Acquisition	Initially resistance toward 'old Western computer systems" to avoid legacy IT Frugality of buying into existing systems "Hacker culture" toward strategy and design Outsource development to agile private sector	Design, experiment, test in-house first	Cut all existing contracts, start with a clean slate	Built or buy decisions Agile acquisition approaches	Built in-house Collaborate across levels of government Replicate	Focused on design practices and preparation of design drafts of digital services	Advise agencies when drawing up requirements
- Scaling and acceptance of services	Banking industry: Kiosks & training Acceptance by example – reputation & personal buy-in	Design at central government first, only if tools work ask other levels of government to co-sponsor 50% of the costs Parallel services until cut-off deadline Training of civil servants & citizens	GDS Academy: Train product owners GOV.UK Design System	Civil service oriented transfer by including project managers as team managers in transformative projects Train product owners	Work with municipalities who buy into the idea first Lead by example Developer platform Designer platform	Conduct user research at start of every project to increase acceptance of final projects	Plan: Select projects with highest impact first
b) HR policies	Open system bureaucracy No hiring restrictions Fixed pay scale	Traditionally no exchanges between industries No HR policies necessary	Freedom to hire under the existing organizational arrangements of	Talent Act; Presidential Innovation Fellowship	No new policies: Commissioner position allows full authority for hiring without restrictions Central	No necessary change in HR policies, designers were already a hiring category in government	HR policy are flexible Payment categories are under revision to allow

Appendix table (*continued*)

Country	Estonia	Denmark	UK	USA	Italy	Finland	Canada
DST's name	Central CIO office	The Danish agency for digitization	Government digital Service (GDS)	18F & United States digital service (USDS)	Team Digitale (TD)	D9	Canadian digital service (CDS)
Human capital, skills	"Skype mafia" Hansa Bank security specialists TelCo specialists Non-profit foundations TigerLeap & See@World train students in IT skills	Initial digital taskforce with 25 young civil servants from different ministries put into a room to imagine and build digital infrastructure projects for an initial 3-year term	Business Link and Direct Gov > 500 staff members "Kids in shorts"	~ 1000 software engineers, UX designers, project managers hailing from Silicon Valley, nonprofits, but also from within government Presidential innovation fellows	technology agency with skills from the 90s Unspecified yet, hired +400 digital service professionals)	Existing government designers, external designers	for new categories, for example for designers Team was founded with small group of initial members 24 employees (2017) Currently hiring designers and programmers

Appendix 2

Fig. 3. Tweet by Amazon.com CEO Jeff Bezos, February 10, 2016, congratulating Italy's Prime Minister Matteo Renzi for hiring Diego Piancentini from Amazon as Commissioner to build the Team Digitale, Italy (screenshot courtesy of Team Digitale).

Fig. 4. Tweet by Matteo Renzi, February 10, 2016, in response to Jeff Bezos, Amazon.com (screenshot courtesy of Team Digitale).

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