Government Information Quarterly 39 (2022) 101681

Contents lists available at ScienceDirect

Government Information Quarterly

journal homepage: www.elsevier.com/locate/govinf

Overcoming barriers to digital government: mapping the strategies of digital champions

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ARTICLE INFO

Keywords:
Digital government
Digital champions
Barriers to adoption
Digital transformation strategies
U.S. federal government

ABSTRACT

Previous research has identified a variety of barriers to digital government, and regularly emphasizes the importance of individuals that navigate institutional contexts and strategically pursue digital government solutions. This exploratory analysis investigates how these individuals understand barriers to digital government and the strategies that they apply to overcome them. Using interviews with digital champions in the U.S government, we extract the tactics employed to overcome these barriers including storytelling, community building, external validation, orientation towards citizen perspectives and a reliance on external peer networks. Results highlight the interconnected nature of barriers and the non-linear quality of strategies, and allow the construction of a theoretical model for structural and cultural barriers and strategies as experienced by digital champions. This model highlights the perceived efficacy and impact of cultural strategies, and the association of these strategies with external peer networks and citizens, and a tension in how digital champions describe actors and approaches introduced from the private sector.

1. Introduction

Adopting and implementing digital technology has been a major policy objective of governments around the world since the mid-1990s (United Nations Division for Public Economics and Public Administration, 2001). There have been significant changes to how this is conceptualized over the last decades, however, and Janowski's (2015) digital government evolution model tracks the development of digital government towards increasing complexity and specialization over time and across four stages, including *digitization* (marked by technology adoption and implementation), *transformation* (marked by internal institutional change), *engagement* (marked by changed relationships with stakeholders), and *contextualization* (marked by increased specialization and orientation towards public policy). The objectives of digital government vary across these evolutionary stages, as do the barriers faced by public administrators seeking to achieve them.

However, with every new wave of technology similar questions regarding implementation barriers and how to overcome them are posed. In this context, three general observations can be made. Firstly, though case studies regularly offer strategic recommendations for pursuing specific aspects of digital transformation, there has not yet been a systematic effort to map the strategies that can be leveraged for overcoming specific barriers to digital government. Secondly, authors exploring different stages of e-government consistently distinguish between structural barriers related to rules, capacities, resources, or business processes, and cultural barriers related to norms, perceptions and expectations within public administrations (Eynon & Dutton, 2007; Meijer, 2015; Ofoeda, Boateng, & Asmah, 2018; Schwester, 2009; Van Veenstra, Klievink, & Janssen, 2011; Wirtz, Piehler, Thomas, & Daiser, 2016). Thirdly, the literature on digital government barriers consistently features the actions and capacities of individuals working to overcome these barriers, including managers (Pittaway & Montazemi, 2020), CIOs (Almazan & Gil-Garcia, 2011) and digital experts (Mergel, Edelmann, & Haug, 2019). The roles and activities of these individuals vary significantly, but can be considered collectively as supporters of ideas, technologies, or other strategies to overcome barriers to digital government, hereafter referred to as digital champions.

Despite the prominence of digital government champions in research on digital government barriers, there is limited of how they experience and address those barriers, with the notable exception of Meijer's (2015) e-governance case study. Nor has research identified how champions of digital government conceptualize barriers and strategies by which such

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https://doi.org/10.1016/j.giq.2022.101681
Received 4 December 2020; Received in revised form 31 December 2021; Accepted 6 February 2022
Available online 20 February 2022
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Konstanzer Online-Publikations-System (KOPS)
URL: http://nbn-resolving.de/urn:nbn:de:bsz:352-2-177fhwb83amcu6

barriers can be overcome. This article provides exploratory analysis to fill that gap by pursuing the following research questions:

What are the barriers to digital government implementation experienced by digital champions?
What strategies do digital champions apply to overcome barriers to digital government?
How do digital champions conceptualize the relationship between cultural and structural barriers and strategies to digital government?

These questions are applied to interview data from digital champions working in and with a variety of U.S. government institutions. An integrated deductive and inductive analytical process is used to identify the barriers and strategies that they find most salient in advancing digital government. The resulting theoretical model provides insights into how individuals working actively to advance digital tools and processes in government experience and engage with structural and cultural barriers to digital transformation. In doing so, this analysis contributes to understanding the complex interplay between structural and cultural aspects of digital government evolution, and identifies several dynamics that play a key role in those processes, but have not been explored in previous research.

The article proceeds as follows. This introduction is followed by a section providing background on different conceptualizations of digital government, associated barriers and strategies, and the role of digital champions. A third section describes the research design, including information on the interview sample and the method used to identify concepts in the interview data. This is followed by a section on findings, which presents interview data and analysis, and a discussion section which considers the relationship between cultural and structural barriers and strategies, and synthesizes a theoretical model for the strategies of digital champions. The conclusion in the final section summarizes key findings and contributions, before suggesting limitations and avenues for further research.

2. Background

The body of research on government technology is rich, spanning multiple disciplines and attending to concepts as varied as the virtual state (Fountain, 2001), digital-era governance (Dunleavy, Margetts, Bastow, & Tinkler, 2006), electronic government (Luna-Reyes, Gil-Garcia, & Romero, 2012), e-governance (Meijer, 2015), government innovation (Schank & Hudson, 2018), data-driven government (Luthfi & Janssen, 2019), open government (Schnell, 2020), and most recently, digital transformation (Mergel, Edelmann, & Haug, 2019), to name a few. Several case studies have documented obstacles to government use of digital tools in pursuit of the above concepts, often distinguishing between structural barriers such as limited capacities, technical infrastructure, or resources, and cultural barriers associated with perceptions, norms and expectations. We briefly review some of this work in order to provide a preliminary mapping of barriers and strategies to digital government. In doing so, we follow Janowski's (2015) use of the umbrella term "digital government" to encompass the disciplinary and conceptual diversity referenced above, in the absence of a "universal model existing to inform government digitization efforts in different national, local and sectorial contexts" (p. 221).

2.1. Barriers to digital government

Structural barriers are prominent in a recent review of digital transformation research and practice, including technological barriers (infrastructure, lack of interoperability, data access), organizational factors (lack of strategy, human resources, digital skills, capacities of managers), legal and ethical factors (lack of citizen trust), and factors related to limited budgets or competition for financial resources (Barcevičius et al., 2019). These structural barriers are also prominent in e-government research, including recurrent attention to the limitations imposed by outdated technical infrastructure and limited technical resources (Ebrahim & Irani, 2005; Norris & Reddick, 2013; Savoldelli, Codagnone, & Misuraca, 2014). Schwester's (2009) comparative analysis of U.S. local governments found financial barriers within government preventing investment in e-government, and a report by the U.S. digital service team 18F (Pandel, Harrell, Fenton, & Zeichner, 2018) emphasized organizational reliance on outdated legacy systems. Individual technical capacities and skills have also been highlighted in several studies (Ebrahim & Irani, 2005; Eggers & Bellman, 2015; Martin, 2014; Meijer, 2015; Van Veenstra et al., 2011).

A 2015 survey on digital transformation perceptions conducted by Deloitte (Eggers & Bellman, 2015) demonstrated how structural barriers are experienced by individuals, and suggests that public administrators face too many competing priorities, insufficient funding, security concerns, and lack digital workforce skills. Tangi, Janssen, Benedetti, and Noci (2020) review of the transformation literature groups lack of skills and support together with organizational complexity and lack of coordination as the most salient structural barriers to digital transformation. Individual perceptions is the focus of a study by Wirtz and Daiser (2018), who identify five cognitive barriers that impede public servants in implementing open government data (related to perceptions about legal barriers, bureaucratic barriers, and the risk aversion of government employees, which was shown to have the most potent effect on resistance to open government data). Perceptions of structural barriers are closely related to what Meijer (2015) characterizes as cultural barriers, including risk aversion, bureaucratic culture and fear of change. Meijer's e-governance case study also notes the integration of cultural barriers with structural barriers, including "legal constraints, lack of finances, shortage of personnel and available skills, limited political and management support, lack of coordination, technological constraints" (p. 200). This point is echoed by surveys on perceived barriers to open government (Martin, 2014, and Van Veenstra et al.'s (2011), p. 226) review of the literature on transformational government, which states that "Impediments simultaneously occur on the governance, the organizational and managerial, and the technical levels. Impediments represent an interrelated set of factors that need to be addressed in concert."

Cultural barriers are also regularly referenced independently, including prominent attention to established ways of doing things in bureaucracies (Barcevičius et al., 2019; Ebrahim & Irani, 2005; Martin, 2014; Norris & Reddick, 2013; Pandel et al., 2018; Savoldelli et al., 2014; Schwester, 2009; Tangi et al., 2020), and a lack of organizational leadership, vision and strategy (Barcevičius et al., 2019; Ebrahim & Irani, 2005; Eggers & Bellman, 2015; Howes & Kidney Bishop, 2018; Martin, 2014; Meijer, 2015; Norris & Reddick, 2013; Savoldelli et al., 2014; Schwester, 2009; Tangi et al., 2020). The importance of cultural barriers in government can also be read in Savoldelli et al.'s (2014) findings that e-government adoption is not significantly improved by the removal of key structural barriers. Pittaway and Montazemi (2020), meanwhile, argue that the most important barrier to digital transformation is the tacit information about how to manage structural and cultural barriers, asserting that "digital transformation has stagnated because city managers lack the requisite know-how to replace legacy system silos with integrated enterprise systems" (p. 1). Howes and Kidney Bishop (2018) situate this know-how within institutional efforts to gain support for digital transformation projects in the UK government, and note that these efforts often fail because digital teams fail to make convincing arguments about the value of transformation, or fail to "recognise the uncertainty inherent in digital transformation, locking programmes into fixed and unrealistic timelines" (p.3).

2.2. Strategies to achieve digital government

The notion of strategies for digital government is imprecise, and may refer to formal policy documents implemented by local or national

governments (Seifert & Mcloughlin, 2007; Weerakkody, El-Haddadeh, Sabol, Ghoneim, & Dzupka, 2012, respectively). The literature on digital transformation often recommends organizational strategies for other government bodies and institutions, which may or may not be formalized as policy instruments (Eggers & Bellman, 2015; Mergel, Edelmann, & Haug, 2019; Pandel et al., 2018). Several authors also emphsize more granular and informal strategic approaches to pursuing specific aspects of digital government, often driven by the nature of barriers at issue in a given case study. Thus, restructuring strategies are prominent in work on instituting digital teams (Bracken & Greenway, 2018), or the integration of IT departments (Pittaway & Montazemi, 2020), while the promotion of knowledge sharing and social media use is emphasized in studies of social media innovation (Khan & Khan, 2019).

With the notable exception of Meijer's (2015) attention to "fixing" and "framing" strategies, however, informal strategies to achieve digital government have not been explicitly catalogued, or distinguished according to whether they target structural or cultural aspects of digital government. When categorized as such, we find 25 distinct barriers and 16 distinct strategies that are prominent in previous research on digital government. These are presented in Table 1, in order of frequency, and with the number of articles in which they were referenced noted on the far right.

Table 1
Structural and cultural barriers and strategies to digital government.

	Barrier/strategy	#[a]
Structural barriers	Financial and human resources	17
	Legal frameworks (incl' privacy and security)	12
	Capacity and skills (technical)	10
	Rigid and siloed organizational arrangements	11
	Technological infrastructure (computers and networks)	9
	Lack of organizational mandates	3
	Technological resources (software and standards)	2
	Capacity and skills (project management)	2
	Procurement processes	2
	Technical debt (institutional reliance on outdated technological platform)	1
Cultural barriers	Political and management support and leadership	13
	Institutional habits and established "ways of doing things"	11
	Lack of engagement with and demand from users/citizens	10
	Risk aversion	10
	Hierarchical decision-making	8
	Organizational vision	7
	Perceived barriers related to law, organizational practice, finances	5
	Lack of awareness/strategic thinking	5
	Difficulty articulating benefits to others	4
	Political coordination	4
	Organizational strategy	4
	Workload and competing priorities	3
	Lack of evidence base	1
	Ethical concerns	1
	Managerial "know how" and tacit knowledge	1
Structural strategies	Restructuring organizations and/or service lines	5
	Capacity development	6
	Adopt organizational strategy	4
	Building cross-functional teams and/or organizational connections	3
	Develop forms of access and feedback with citizens and stakeholders	2
	Restructuring IT departments	2
Cultural strategies	Adopt agile and user-centered practices	5
	Promote culture of knowledge sharing, innovation & organizational change	5
	"*Re*-conceptualization" of interactions with citizens	4
	Establish political and digital leadership and strategy	3
	Transfer of procedural knowledge between peers and organizations	2
	Exploit crises and trigger events	2
	Coordination and networking with private sector	2
	Increase the use of social media at work	1
	Refer to authoritative guidance	1
	Identify and promote "quick wins"	1

[a] Specific articles referencing barriers and strategies are listed in Annex A.

2.3. Structure and culture in the evolution of digital government

Reviewing the distinction between cultural and structural aspects of digital government in light of Janowski's (2015) evolutionary model reveals that structural barriers are most prominent in the research on e-government and government technology adoption, which aligns with that model's first phase (Ebrahim & Irani, 2005; Savoldelli et al., 2014; Schwester, 2009). Institutional culture and processes are addressed in this literature, but they are much more prominent in research on digital transformation (Mergel, Edelmann, & Haug, 2019; Tangi et al., 2020; Virkar et al., 2019) and government engagement with external stakeholders (for example, Chadwick, 2011; Freeman & Quirke, 2013; Welch & Feeney, 2014), corresponding with the second and third stages in Janowski's model. This could be read to imply a sequence; whereby structural barriers must be overcome before addressing obstacles related to organizational culture in government. This reading is reinforced by the explicit incrementalism of Janowski's model, which progresses from technological, through institutional and relational change, and in which "capabilities required at one stage require capabilities built at earlier stages" (Janowski, 2015, p. 233).

Scholars differ, however, on the sequence through which structural and cultural barriers are addressed in achieving digital government. Meijer (2015), for example, identifies two overarching strategies for addressing structural and cultural barriers, and argues that the strategy for overcoming cultural barriers "primarily takes place in the earlier phases of the [e-governance] innovation process and [the strategy] for overcoming cultural barriers] becomes important in the later phases" (pp. 200, 205). In contrast, Tangi et al.'s (2020) case study on transformation argues that digital technologies first change the "technical system of an organization", and only subsequently change institutions "social systems", which is "a longer and more difficult process" (p. 51). Part of this tension may be explained by the different stages in which these two studies are situated. After several decades of government technology adoption, this would suggest structural obstacles have in many cases been overcome, and contemporary digital government challenges will be more cultural than structural in nature. It may also be that processes of digital government are generally too complex and contingent as to discern any such consistent patterns. As Pittaway and Montazemi (2020) note, digital transformation processes are rarely clean linear progressions, and "digital transformation can progress or regress iteratively in different organizational dimensions at different paces over time in government" (p. 2).

Generally, research on transformation processes recommends that public administrations adopt a holistic approach incorporating both cultural and structural strategies (Mergel, Edelmann, & Haug, 2019) and simply adopting digital tools and processes appear insufficient to facilitate cultural change in organizations (Tangi et al., 2020). Networks have been suggested as a mechanism for identifying and adapting both cultural and structural strategies (Pittaway & Montazemi, 2020). There is ample research on how government networks facilitate policy adoption (Lecy, Mergel, & Schmitz, 2014) and how individuals navigate those networks in order to facilitate peer learning (Cristofoli, Trivellato, & Verzillo, 2019; Kinder, Six, Stenvall, & Memon, 2020; Siciliano, 2017). Other authors have emphasized internal formal capacity development (Bracken & Greenway, 2018; Eggers & Bellman, 2015; Meijer, 2015). Weerakkody, Janssen, and El-Haddadeh's (2021) comparative study recommends that structural changes need to be accompanied by a "well thought out education and training programme [that] ensures buy-in and ownership..." by public servants at all levels in order for transformation efforts to take root (p. 18).

There is no clear indication in the research on digital government about what other types of strategies might be effective in overcoming cultural barriers to digital government, though the importance of adopting practices and experiences from the private sector is

emphasized in the grey literature produced by private sector consultancy firms and think tanks (Eggers & Bellman, 2015; Partnership for Public Service & IBM Center for the Business of Government, 2018; World Economic Forum, 2017). A report from Accenture. (2015), for example, argues that "by observing digital innovations in the private sector, the public sector can [...] accelerate the benefits of digital government," and enact "major changes in both governance and culture as part of the journey to becoming a digital leader" (p. 8).

Public sector adoption of digital practices from the private sector is well documented in the research on digital government, particularly regarding the first stage of digitization, in which "most technology-enabled innovations [were] directly adopted" from the private sector (Janowski, 2015, p. 230). Similarly, organizational processes from the business sector are prominent in research on digital transformation, who's conceptual pedigree can be traced directly to the private sector notion of business process reengineering (Nograšek & Vintar, 2014). Researchers describe the private sector as a prime source of government expertise (Mergel, Bellé, & Nasi, 2019) and "know how" for government's digital transformation (Pittaway & Montazemi, 2020), while experts describe demands from the private sector as a key driver of transformation processes (Mergel, Edelmann, & Haug, 2019). Interviews conducted with government innovators meanwhile find that civil servants lacking formal guidance on government innovation "figure out how to do their jobs [by using] practices taken from the private sector" (Schank & Hudson, 2018, p. 25).

2.4. The role of digital champions

The strategies presented in Table 1 are often associated with the efforts and objectives of individuals working in government, including managers and institutional leaders who are prominent in this regard, given their capacity to coordinate and inspire other actors (Eynon & Margetts, 2007; Khan & Khan, 2019; Pittaway & Montazemi, 2020). The role of chief information officers has been subject to much attention (Almazan & Gil-Garcia, 2011; Bongiorno, Rizzo, & Vaia, 2018; Bovens & Zouridis, 2002), though individuals not in leadership positions have also been highlighted, including digital service experts and teams in recent research on digital transformation (Bracken & Greenway, 2018; Mergel, 2019) and civil servants managing digital programs (Howes & Kidney Bishop, 2018). The literature on innovation likewise emphasizes individuals across hierarchical levels of government that promote, embed and disseminate good ideas (Meijer, 2014), and studies on digital transformation and e-governance have explored the contributions of project managers and administrative specialists that actively navigate barriers and promote solutions for digital government (Chadwick, 2011; Mikalsen & Farshchian, 2020).

The lack of formal characteristics shared by these individuals has led some authors to focus on the personal traits displayed by people driving digital government processes, identifying "motivated individuals" (Mergel, Gong, & Bertot, 2018) or "tech-savvy leaders" (Pandel et al., 2018). Others have emphasized individuals' activities, such as the use of inter-organizational networks to leverage knowledge or resources for digital government (Fountain, 2001; Henman & Graham, 2020; Pittaway & Montazemi, 2020). The concept of champions for digital government has been applied with rhetorical variation across the literature, including reference to innovation champions (Meijer & Bekkers, 2015; Tat-kei, 2004), open government data champions (Dawes, Vidiasova, & Parkhimovich, 2016), project champions (Kamal, Weerakkody, & Irani, 2011), and idea champions (Toots, 2019). The general idea is consistent however: champions are enthusiasts with specific capacities, and their engagement is necessary "to promote and overcome the bureaucratic obstacles in order to implement digital government plans and introduce technological innovations into the public sector sphere" (Sandoval-Almazán et al., 2017, p. 2).

The importance of champions to digital government is often articulated in regards to their ability to informally navigate cultural barriers, and recent studies have highlighted "the importance of having champions within government who are able to overcome resistance and to implement and scale change" (Noveck & Glover, 2019, p. 11). Other authors emphasize the importance of creating formal networks to enable champions (Maccani et al., 2020), or the formal positions of individuals within institutions, and Eynon and Margetts (2007) recommend creating the formal position of a Chief Information Officer (CIO) to act as a digital champion. Digital champions may not be employed by government at all, however. Several studies have noted the importance of engaging with champions through external networks (Dawes et al., 2016; Kamal et al., 2011; Toots, 2019), and the grey literature regularly recommends identifying and engaging with "external champions" (Eaves & McGuire, 2018; Government Services Administration, 2018).

The notion of digital champions is thus a broad and heterogenous one, spanning important differences of sector, authority, and mandate, all of which likely shape the ways in which individuals conceptualize and approach digital government barriers and strategies (Guenduez, Mettler, & Schedler, 2020). Despite these differences, digital champions are a worthwhile unit of analysis because of their unique motivation and role in advancing digital government, in much the same way that policy entrepreneurs are a key unit of analysis for understanding policy change (Chatfield & Reddick, 2018). This is clear when reviewing the grey and academic literature that proposes tactical steps for achieving digital government, where digital champions are regularly both the explicit target audience (for example, Eggers & Bellman, 2015), and a necessary ingredient for advancing digital government across it's evolutionary stages (Eaves & Clement, 2018; Government Services Administration, 2018; Noveck & Glover, 2019), from the digitalization of forms, to the transformation of culture and the contextualization of policy (Janowski, 2015).

3. Research design

Our study identifies conceptualizations of structural and cultural barriers and strategies in interview data, through a combination of deductive and inductive analyses. This involved a five-step process, as displayed in Table 2. First, relevant literature was reviewed in order to generate a theoretical start list of barriers and strategies. These first-order concepts were then used to code interview data, identifying

Table 2
Analytical process.

Phase	Output	Example
Review of literature	Theoretical start list (1st Order Concepts)	Rigid and siloed organizational arrangements inhibit the use of digital tools
Deductive coding interview data	Identify relevant sections of interview responses	"They have commodity and mission IT reporting up to the same person. […] And so CIO's are supposed to set up to fail."
Inductive coding interview data	1st Order Aspects	The role of Chief information Officers (CIOs)
Grouping 1st Order Concepts and 1st Order Aspects	2nd Order Themes for barriers and strategies	*Governance structures* are a 2nd order barrier derived from the co-occurrence of 1st Order Aspects (legal frameworks, rigid organizational arrangements, and lack of organizational mandates) and 1st Order Aspects (role of CIOs, institutional silos and political transitions)
Sorting 2nd Order Themes	Conceptual mapping of structural and cultural barriers and strategies	*Governance structures* are a structural barrier, in contrast to the cultural barriers of *institutional culture* and *lack of awareness*

interview responses that described specific barriers or strategies. Following Gioia, Corley, and Hamilton (2013), this deductive coding phase was followed by an inductive coding phase, in which specific aspects of barriers and strategies were coded from those portions of interview responses. In a fourth stage, first-order themes deducted from the literature, and first order aspects inducted from interview data were grouped according to similarities. This resulted in the identification of second order themes for barriers and strategies to advance digital government that were emphasized in the interview data. Finally, the second order themes were sorted in order to distinguish between structural and cultural conceptualizations of barriers and strategies.

3.1. Interview data

The research team conducted field-based, in-depth interviews with digital government champions, recognized by their peers as having promoted and advanced digital government policies and processes in specific government institutions or programs. To identify such individuals, three consultation events were held at national and international conferences on government technology, and queries were sent to e-mail lists associated with the U.S. Digital Service (USDS). A snowball approach was applied to the individuals identified through these activities (Goldstein, 2002; Myers & Newman, 2007), resulting in a total of 70 interviews which were conducted between December 2018 and March 2019.

Of the 70 interviews conducted, 55 discussed specific strategies or barriers in particular institutional contexts and were recorded, transcribed, and coded. The resulting sample included interviews with 55 respondents that worked to advance digital government at the city, state or federal level of government. The majority of these did so from within government agencies and institutions, but several respondents worked with government institutions from civil society organizations such as think tanks, national networks, or academic centers. Respondents occupied a variety of roles, levels of seniority, and technology-related mandates, and several had experience from multiple sectors or multiple levels of government. Table 3 presents the primary sectors in which respondents worked, and a detailed overview of roles and backgrounds is presented in Annex B.

Interviews consisted of two broad questions. The interviewees were asked to describe their perspective on the most important way that digital tools and approaches could improve government. They were then asked to reflect on what inhibited government from adopting digital technology towards that vision, and strategies to overcome those barriers. Interviews were loosely structured, and the use of neutral language was used to encourage reflection on those barriers and strategies respondents felt were most important, using their own language and concepts (Myers & Newman, 2007). This open-ended approach sought to draw on the embedded knowledge of experts with highly specific knowledge from a variety of professional, sectoral, and institutional contexts (Hammer & Wildavsky, 2018).

Interviews were transcribed verbatim and the frequency of first order aspects was noted to indicate emphasis. When respondents repeatedly described a particular aspect of barriers or strategies after discussing something else, this was understood to represent the perceived importance of barrier or strategy, and these were coded as additional references.

Table 3
Interview respondents by sector.

Federal government	25
City government	13
State government	1
Civil society	16
Total number of interviews included in analysis	55

4. Findings

The analysis identified four types of barriers and six types of strategies prominent in how digital champions describe digital government. These are categorized as either structural or cultural and presented as the 2nd order concepts in Figs. 1 and 2, together with the first order concepts derived from the literature, and the 28 first-order aspects that were drawn from interview responses. The frequency with which respondents mentioned barriers and strategies is displayed in Table 4, indicated in parentheses by the number of interviews in which concepts were referenced and the total number of references across all 55 interviews.

The clearest finding observable here is the dominance of cultural strategies, both in terms of frequency (Table 4) and complexity (Fig. 2). Detailed interview responses presented in Sections 4.1 and 4.2 show that respondents emphasize the importance of both structural and cultural barriers, but that cultural strategies were more prominent than structural strategies. As discussed in Section 5.2, responses also emphasized the complex and interdependent nature of structural and cultural barriers, and the secondary effects that cultural strategies could have on structural barriers.

4.1. Barriers to digital government

Structural barriers featured prominently in interview responses, and most significantly in regard to *capacities and resources*, which were presented 31 times by 21 respondents. This included references to a lack of technical skills that are required for specific projects, and a shortage of mechanisms for professional development and skill development within government. Non-technical skills also featured prominently, including leadership and management skills. Several respondents emphasized a mismatch between the institutional roles mandated to Chief Information Officers (CIOs), and the organizational and management skills that people in those roles tend to have. In particular, CIOs were described as lacking the "people skills" necessary to manage transformational processes.

When discussing limited skills and capacities in government, the majority of respondents noted the importance of hiring people with appropriate skills, because "it's very hard to give people … new technical skills once they're in government" (GF20),[1] but also described a host of challenges associated with hiring people with the appropriate skills. Several respondents described a tendency for government to hire the wrong people with the wrong skill sets for working with digital tools in government. This was regularly attributed to a failure to understand the skills that be hired for, as well as administrative barriers and the "inflexibility around processes and rules which are codified through very formalized processes" for hiring (GC13). Importantly, several respondents also noted supply-side barriers in this regard, and the difficulty of attracting experts from the private sector.

> The right question is why would anyone technical come and work in government. Um, because I'm sorry, like you can make more money, the companies can make a pitch that says, you'll change the world, you know, you'll have a huge impact, uh, you'll change personal mobility, or, personal genomics, or, you know personal health, or whatever, you know, come to our company.
>
> (GF1)

Sixteen respondents also described *governance structures and*

[1] Interview quotes are attributed to respondents in parentheses, using sequential ID numbers, preceded by a two-letter code indicating whether they described experiences while working in federal government (GF), state government (GS), city government (GC), or civil society (CS). Details are provided in Annex B.

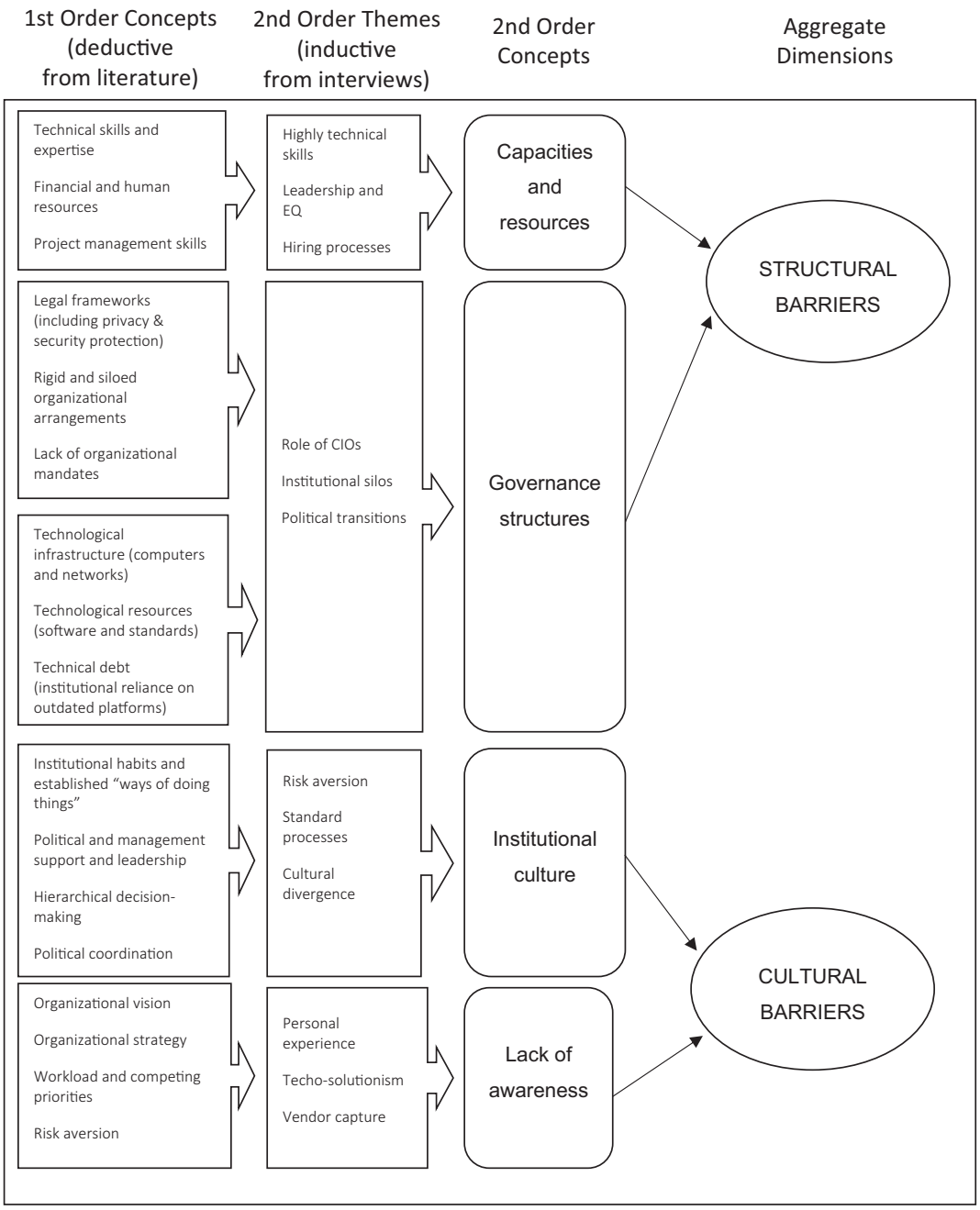

Fig. 1. Conceptual map of structural and cultural barriers.

institutional arrangements as inhibiting digital government. This was often mentioned in vague and disparaging terms in regard to bureaucratic structures ("the muck that is government sometimes" [GF12]), but several respondents also described specific institutional barriers. As noted above, they observed that the role of the CIO is not well positioned to facilitate digital transformation, because the role demands both technical and managerial experience. Some respondents suggested that CIOs often lack sufficient technical expertise, others suggested that CIOs often lack sufficient managerial experience. Despite this inconsistency, the role itself was consistently described as not fit for purpose, and the consistency and intensity with which this concern was expressed is noteworthy. As one respondent noted, "I'm growing to think that the role of the chief information officer is one of the scariest things for the future of technology in government" (GC1). Respondents regularly described a lack of coordination and institutional silos interlinked with other barriers. Other barriers were less frequent, and tended to describe dynamics over which individuals could exercise less influence. These included things like outdated and inflexible rules and regulations, and limited budgetary resources. Additionally, respondents regularly noted the exacerbating effect that vendors have on digital government, asserting that they drain government resources, perpetuate low capacity in government, and diffuse notions of technological solutionism, while holding monopolies on actual technology solutions. Vendors were consistently described as exploitative and fundamentally opposed to government's duty to the public good.

Cultural barriers were more prominent in the interviews than structural barriers, particularly *institutional culture*. Broadly understood as organizational cultures and ways of doing things, institutional cultural barriers were mentioned 50 times and by more than half of the respondents. They were often described as the culture of risk aversion,

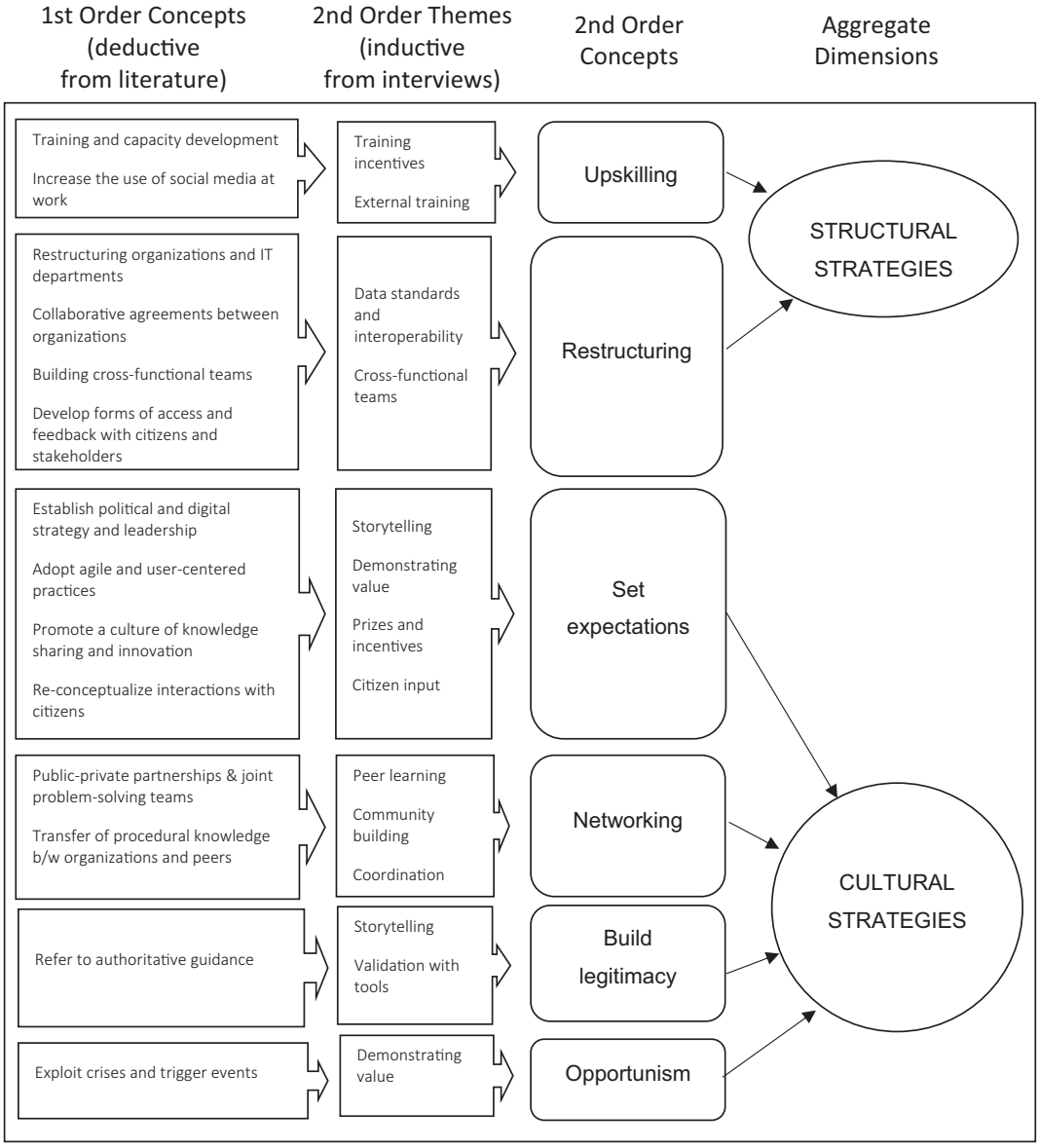

Fig. 2. Conceptual map of structural and cultural strategies.

Table 4
Frequency of references to barriers and strategies.

	Structural	Cultural
Barriers	Capacities and resources (21/31) Governance structures (16/18)	Institutional culture (28/50) Lack of awareness (23/41)
Strategies	Restructuring (5/6) Upskilling (4/4)	Set expectations (37/51) Networking (34/51) Building Legitimacy (14/20) Opportunism (10/11)

fear, and a lack of incentives to deviate from the way things had always been done.

> [...] it's just hard to break out of the way, the norms and cycles that 'we've been done things for so long'. And, and quite frankly, most folks, especially when you are at a political level, aren't incentivized to do that.
>
> (GF15)

Several respondents described a fundamental aversion to risk as inherent to government, in a world where "everybody has a veto" (CS5), but particularly daunting in the context of technology, due to low levels of technical literacy and exacerbated by misinformation about regulations and how digital tools work. As one respondent noted, "people don't even try to do it because they've been told it's not possible, when it is possible […] you can spend so much time, like debating and trying to understand what is and isn't allowed" (GF2).

Descriptions of institutional culture also emphasized cultural differences within institutions, such as communication failures between "technology experts" and "policy experts." This distinction was sometimes described in terms of civil servants who have a strong professional ethos and specific expertise, but who struggle to adapt to the "the agile, fail fast kind of culture that we're trying to get to with some of these other kinds of initiatives" (GF19). Similar cultural differences were regularly described in regard to a private sector approach to using technology. Describing digital technology as "an environment where the pace of change gets faster," one respondent described government culture as a "structure that is designed to favor stability [and] is likely to fall increasingly behind the other societal structures that are optimized for

change" (GC13). Simultaneously, several respondents noted that the risk aversion inherent to government culture is entirely appropriate in comparison to the private sector ethos of "fail fast and break things" (GC13).

Lack of awareness was the second most prominent barrier in interviews, and was described 23 times and by just under half of the respondents. This was often explained in terms of a lack of technological familiarity or literacy. As one respondent described it, "folks don't know what they don't know, […] the biggest problem is getting people that actually know what they're talking about inside the building" (CS9). This barrier was particularly salient when attempting to get support from managers, or to initiate coordination or collaboration across institutions or teams, where technology and innovation teams are not always "seen as legitimate" (GC2). Many respondents emphasized a lack of awareness about the value that technology could add, rather than awareness of technology per se. "[I]f you've just never seen it before, and you haven't seen the benefits of doing that, […] why would you even try that?" (GF24). This was often described as contributing to techno-solutionism in government, where excitement about digital tools drives projects and "… the tool is kind of selected before you even really know what you wanna do with the project" (GC9). Several respondents also described situations in which this dynamic was facilitated by technology vendors, and suggested that the idea of digital transformation as "a term of art that contractors use to try to sell their goods and services to government" (CS1).

4.2. Strategies for advancing digital government

Strategies for leveraging the structural aspects of digital government were not widely represented in the interview responses. *Upskilling strategies*, involving training, capacity development or professional development activities were described by four respondents. Five respondents, meanwhile, described strategies for *restructuring* government institutions. One of them described a strategy for creating technology teams that are cross-functional (with both technological and policy expertise represented) and co-located (situated within multiple organizational units), and described the utility of cross-functional and co-located across digital government contexts:

> Honestly, like every time I network on a team, my main recommendation is, oh gosh, you have a separate tech team, you […] have to break this silo.
>
> (GF10)

Four respondents described strategies for improving the role Chief Information Officers (CIOs). This included strategies for changing hiring processes and mandates, as well as the importance of creating that role in order to signal priorities and secure resources.

Strategies for engaging cultural aspects of digital government were much more prominent in interviews, described by 48 of the 55 respondents. This most commonly involved strategies to *reset expectations* regarding the appropriateness and potential of digital tools in government, and were often grounded in the idea that government technology-use lagged behind societal trends, because "there's literally nothing in modern life that is not mediated by technology" (GF 15). These strategies were unified by their ambitions to bring the assumptions and expectations of civil servants, public administrators, and institutions into alignment with this "new normal" (GF8). Several respondents described this imperative with reference to "private sector mentality" (GC3), and expressed a hope that private sector thinking could disrupt governmental inertia and path dependency.

Some respondents described specific ways that private sector thinking could help reset expectations about digital government, which align closely with structural strategies presented above. This included tactics for partnering and collaborating with the private sector (GF11, GC1, CS6) as well as hiring individuals from the private sector (GF21), or using fellowships and short-term appointments "to get entrepreneurs and other folks [from the private sector] to you know exchange ideas, to help move projects along" (GF3). Most references were, however, limited to vague descriptions of the need to change government business as usual, and to begin "using practices, maybe from the private sector, or from design, or from the tech sector, whatever we want to call it" (GF16).

Several tactics were mentioned that did not reference the private sector, including the use of storytelling to highlight the value that digital tools can add to government work, or the important role played by political leadership in setting expectations within an institution, by allocating resources, adopting strategies, or simply articulating a clear vision. This was seen as essential for building momentum for digital government evolution, so that "everybody in the organization knows what the roadmap is and where they're going, and can articulate that" (GC3). Some respondents also described how internal capacity development could be designed to target attitudinal change across institutions:

> [the certificate program was] not really meant as skill development as much as it was around culture change […] it was sort of you know, it was a Trojan horse in a way, to bring these managers and others along who might feel threatened […] were actually diffusing innovation, technology design, data science, throughout the agency itself, by finding these sort of like early adopter types if you will.
>
> (GF7)

Nearly as prominent as expectation setting, *networking strategies* were referenced by 34 of the 55 respondents, and were described in relation to various benefits. The most prominent of these benefits was the opportunity to learn from peers across contexts, which often involved exchanging highly specific knowledge and experiences in networks,

> to talk about like best practices, like what is the hardware that you use, what is the software that you use, what did implementation look like, how did you get contractors to actually use this, how did you get buy-in from your staff.
>
> (GC6)

Other respondents described the potential to replicate digital service projects and organizational processes across contexts, and saw networking strategies as a mechanism for diffusing good practice with digital technologies in government. Sometimes networking was described as a way to find inspiration, as a way of finding "people to bounce ideas off of, hear what's worked and what hasn't worked in other places" (GC2).

Many described networking activities delivering concrete benefits for individuals, such as finding jobs or trainings to build specific skills relevant to digital government. Other benefits described were communal and social, and several respondents emphasized the potential for "building a movement" by diffusing a culture for better technology in government by diffusing things like "shared language" and a common vision. Other respondents saw cultural and social benefit as the most important objective for networking:

> [E]ven if you don't learn new things, if you're hearing the same thing over and over from other people, I think there's still value in that, which is like you're confirming that hey, I'm not insane this is how this actually works.
>
> (GC5)

Others described structured networking activities as "therapy sessions" where individuals struggling to promote transformative processes can discuss and process the challenges they face. As blithely put by one respondent, it's "incredibly helpful just to whine to each other" (GF18). The role of network conveners and hosts was emphasized consistently by

respondents, and several described their interaction with formal networks, events and fellowships, such as those coordinated by the nonprofit organization Code for America.

A third set of strategies involved efforts to *build legitimacy* of digital tools, processes, and teams within government institutions, and was described by fourteen respondents. These were often grounded in a perception that technology was viewed with suspicion or aversion. Sometimes, these strategies involved specific types of interactions or activities that would help to integrate different types of experts, such as "ride-alongs," in which technology experts accompany street-level bureaucrats on field visits, or encouraging policy experts to attend government technology conferences and events. More often, however, respondents described the importance of simply demonstrating the value that digital tools and processes can add to core government activities, in response to the awareness about the barriers described above. Narratives were prominent in these descriptions, but several respondents noted that often the value of digital tools had to be experienced to be understood, and these strategies often targeted leadership.

> I wanted to like talk to the mayor 'bout moving all of our servers into the cloud. And you know, his first question is like 'What's the cloud?' and his second question is 'Has anybody else done this?' And so when I can point to, that he's going to read the USDS playbook, but I can point to it and I can say yes, this is happening all over the country, and there's a roadmap for it, and we're going to follow that and we're going to learn the lessons from the people who have already done this, like that's massively reassuring. And then in some cases I'm able to actually borrow best practices out of that.
>
> (GC13)

Playbooks were seen as a prominent strategy to build legitimacy, and several respondents described modeling their own playbooks on the USDS playbook referenced above.

Lastly, 10 respondents described strategies of *opportunism* that involved leveraging crises or other opportunities in order to embed aspects of digital government in institutions. Sometimes this involved a specific technology deliverable that could demonstrate value. Websites were mentioned several times in this regard, because they are "incredibly tangible and understandable, and the whole organization has a certain kind of investment in it, and it touches everyone in the organization" (CS14), but simultaneously have a tremendous potential to influence business processes and information sharing within institutions. Technology fellowships such as those facilitated by the Code for America network were described as creating opportunities for organizational transformation. Other opportunistic strategies involved creating training events to respond to political demands or aligning the work of digital service teams with the top priorities of political leadership. Others described waiting for a crisis on which to act because they had " a good idea of what needs to change […]. But how do we get there without there being a crisis to align people's interest?" (GC3).

5. Discussion

5.1. Barriers and strategies to digital government

The first two research questions for this analysis aimed to identify the barriers to digital government implementation experienced by digital champions and the strategies they pursued to overcome them. The specific barriers and strategies presented in the conceptual model (Figs. 1 and 2) correspond significantly to those identified in the literature (Table 1), by virtue of the iterative deductive and indictive method applied here. There are nonetheless noteworthy differences in regard to both proportion and content.

In regard to proportion, the moderate dominance of cultural over structural aspects increased significantly in the concepts drawn from the interview data. This is particularly the case in regard to cultural strategies, which were referenced much more often than structural barriers and by more respondents (125 compared to 10 mentions, by 48 compared to 8 respondents, see Table 4). The conceptualization of cultural strategies was also more complex than structural strategies, insofar as tactics like storytelling and validation were redundant and repetitive, mapping across more than one 2nd order concept (see Figs. 1 and 2).

The prominence of cultural aspects in the conceptual model might be explained by asserting that structural barriers and strategies are more important than cultural aspects in early phases of e-government development (Janowski, 2015; Meijer, 2015) and that cultural aspects are not as quickly affected by the adoption of technology (Tangi et al., 2020). If early efforts targeting structural barriers have already been successful in the institutional contexts described in these interviews, then individuals working to advance digital government may have simply turned their efforts towards persistent cultural barriers and corresponding strategies. According to the distinctions asserted by Mergel, Edelmann and Haug (2019), this would imply that the digitization of services and the digitalization of processes are well established and public administrators are pursuing "the cultural, organizational, and relational changes" that mark digital transformation (p. 12). This interpretation is contradicted, however, by the emphasis on digitization and digitalization processes in interview responses, as well as the complex interactions and secondary effects described in relation to cultural strategies.

An additional explanation for the prominence of cultural strategies may be their perceived efficacy, and the perception that structural barriers are more resistant to change. The top-down structures, bureaucratic processes, and "the muck that is government" (GF12) were often seen as necessary evils which needed to be managed and navigated, not barriers that could be overcome (GF3, GF7, GF11, GF12, GC1, GC2, GC3). That is despite the structural barriers, digital champions were able to implement bureaucracy hacks to overcome these barriers. Even when not codified in law, structural barriers like technical capacities, institutional silos, and formalized hiring processes are viewed as reinforcement of so many other barriers that they seem intractable. It's "impossible to snap your fingers, because it requires new directors. It requires a new organizational structure" (GC1). Instead, respondents described using cultural strategies to navigate (and sometimes avoid) structural barriers.

In regard to content, the strategies and barriers identified here provide a much more complicated perspective on how digital champions think about engagement with external actors, networks and expertise. Reference to the needs and perspectives of citizens recurred regularly in interviews, and particularly in regarding legitimacy and expectation-setting strategies, which emphasized the values underpinning Stoker's (2006) articulation of Public Value Management as "a system of dialogue and exchange associated with networked governance" (p. 56) and Dunleavy et al.'s (2006) framework for Digital-Era Governance. Despite the occasional reference to technocratic methods for user design or citizen consultation, however, the strategies presented here did not regularly describe concrete methods for engaging the public along the lines emphasized by some digital government research (Martin, 2014; for example, Meijer, 2015).

Similarly, respondents consistently endorsed private sector expertise and perspectives, particularly when bemoaning government inefficiency and discussing structural strategies related to hiring practices. Descriptions of actual engagement with the private sector were consistently negative, however. Technology vendors were described as "pushing technology, or the notion that technology's a panacea" (CS6), contributing to the adoption of technology tools that did not meet government needs (GC9, GC5, GC7, GF5, GF6, GF25, CS6). This was sometimes presented in quite pejorative terms, describing vendors as "selling snake oil" (GF8), and one respondent suggested that the very concept of digital transformation was "just a term of art that contractors use to try to sell their goods and services to government" (CS1). Several respondents noted that these dynamics contributed to power imbalances and dependency in government technology procurement (GF5, GC2,

GF14), and that this over time also exacerbated capacity, culture, and awareness barriers to digital government (GC5, GC7, GC9, GF17, GF25, CS6, CS6). This negative perception of private sector engagement in digital government evolution contrasts with digital transformation research that recommends learning from the private sector (Pittaway & Montazemi, 2020) or the positive relationship that the literature sometimes presumes to underpin government technology procurement (Mikalsen & Farshchian, 2020), and might be explained with reference to the divergence of private and public sector value systems asserted by theorists of networked governance (Dunleavy et al., 2006; Stoker, 2006). Even in regard to specific private sector applications such as Business Process Reengineering, researchers have distinguished between private sector applications to "reduce costs and increase profits," and public sector applications for "reducing waste and improving citizens' service outcomes and experience" (Weerakkody et al., 2021, p. 18). This perceived value divergence might be particularly salient in the context of technology, because as one respondent noted, the the start-up mantra of "fail fast and break things" doesn't work in government, because "if someone in the private sector goes out of business nothing happens. If government fails, people die" (GC13).

In contrast to citizens and the private sector, government peers were consistently described by respondents as targets for engagement. This was most prominent in networking strategies, but peer learning and interaction was referenced in all other cultural strategies, as well as structural strategies related to interoperability and overcoming silos. Digital champions here identify with a digital government "community" or "movement" that is larger than the particular organization in which they are working. While these dynamics share some similarities with formal government networks for addressing complex policy problems (Lecy et al., 2014), respondents also describe a fluid movement across different types of networks, suggesting something more akin to an informal ecosystem (Kinder et al., 2020). The emphasis on highly personal interactions "therapy sessions" (GF24) and knowing that you're not alone" (GF18), meanwhile, of trust and legitimacy in networks (Cristofoli et al., 2019), and how individuals will "tend to ignore the experts when seeking tacit information, and instead rely on those they feel most comfortable with and who are most accessible" (Siciliano, 2017, p. 104). The importance of personal relationships and interactions across government boundaries can be seen as a bridge between the research on government networks and the research highlighting how individuals in government drive or inhibit the adoption and implementation of digital tools (Cordella & Paletti, 2019; Pittaway & Montazemi, 2020; Rose, Persson, Heeager, & Irani, 2015; Wirtz et al., 2016).

The differences in how different types of external networks and expertise are referenced in barriers and strategies here complicates how these groups are currently addressed in contemporary digital government research.

5.2. *The relationship between structural and cultural barriers and strategies*

The first two research questions for this analysis aimed to assess how digital champions conceptualize the relationship between cultural and structural barriers and strategies. The literature on digital government sometimes recommends strategies for overcoming specific barriers (see, for example Attard, Orlandi, Scerri, & Auer, 2015), or suggests a coupling of structural strategies for structural barriers, and cultural strategies to overcome cultural barriers (Meijer, 2015). In contrast, the digital champions interviewed here described strategies that were expected to address multiple barriers, and cultural strategies in particular were expected to help overcome not only cultural barriers, but also structural barriers by extension. This contradicts the sequencing and coupling proposed by Meijer (2015), as well as studies that assert a linear causal path from cultural change to structural change (Weerakkody et al., 2021) or from structural change to cultural change (Tangi et al., 2020). Indeed, respondents in this analysis described situations in which cultural and structural strategies and barriers were closely intertwined, and in which cultural change in institutions led slowly and incrementally to structural change, aligning much more closely with Pittaway and Montazemi's (2020) description of the messy ways in which "digital transformation can progress or regress iteratively in different organizational dimensions at different paces over time in government (p. 2).

Respondents also regularly described situations in which they hoped that specific strategies would help to address multiple barriers, and situations in which cultural strategies would help overcome structural barriers, or vice-versa. These kinds of cross-over effects were most common for cultural strategies of validation and expectation setting, whereby changes in organizational cultures were expected to positively impact structural barriers to digital transformation over time. Structural strategies were described as having cross-over impacts much less often, and primarily in regard to structural changes to hiring processes, which would affect the cultural makeup of government organizations over

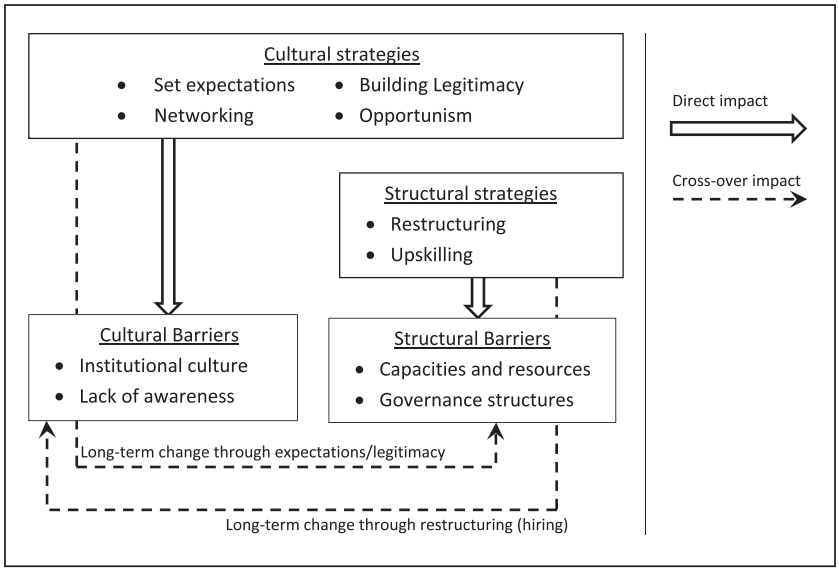

Fig. 3. Theoretical model for the strategies of digital champions.

time. Two respondents also described nesting cultural strategies within structural strategies as a kind of "trojan horse" though this was not expected to have the same kind of long-term effect.

Cultural strategies were more prominent in interview responses than structural strategies. They were also described as having greater efficacy, because they leveraged aspects of digital government over which champions have control, and greater impact, because they were more often expected to address multiple barriers and to have cross-over effects on structural barriers. This suggests a theoretical model, simplified in Fig. 3, whereby those cultural strategies are prioritized for their perceived efficacy and impact, including cross-over effects on structural barriers.

6. Conclusion

This analysis maps the barriers and strategies that are experienced by digital champions working to advance the digital transformation of the U.S. government, through a combination of deductive and inductive analysis of 55 interviews and relevant literature. This results in a conceptual model for distinguishing specific barriers and strategies that are understood to be cultural or structural in nature. The analysis also provides a theoretical model for understanding how different strategies are conceptualized and prioritized by digital champions. Doing so makes three important theoretical contributions to the literature on digital government. Firstly, this analysis draws attention to digital champions as key actors in the evolution of digital government, comparable to the role of policy entrepreneurs in processes of policy change (Chatfield & Reddick, 2018). Doing so provides a foundation for theorizing the role of these actors, whose contributions to digital government evolution have been noted repeatedly by research, but not subjected to direct conceptualization.

Secondly, this analysis provides novel detail and insight into how individuals working to advance digital government understand barriers and strategies for doing so. In particular, interviews highlight how barriers and strategies are experienced as complicated and entangled. In contrast to previous research that has asserted strict sequences or coupling of specific types of barriers with specific types of challenges (for example, Meijer, 2015), this analysis highlights how digital government strategies are expected to address multiple barriers and multiple types of barriers. Digital champions see digital government evolving in a messy institutional context that does not follow the linear sequence of maturity models that is prominent in the literature, and adds important context to theories of punctuated equilibrium in digital transformation (Pittaway & Montazemi, 2020). Digital champions manage this complexity through thoughtful prioritization and combination strategies, and cultural strategies are particularly prominent in this regard, due to their perceived efficacy (when they address the types of barriers over which digital champions feel they have the most control) and potential impact (when they are seen to address multiple types of barriers). Respondents described using specific tactics like storytelling and validation across multiple strategies and targeting both structural and cultural barriers. This adds granularity and nuance to socio-technical theories of digital transformation (Tangi et al., 2020) and stage-based models of organizational culture in digital government (Mergel, Edelmann, & Haug, 2019) that are prominent in contemporary digital government research.

Lastly, this analysis finds significant attention paid by digital champions to external networks and expertise, with a high premium placed on the perspectives of citizens and the private sector, but strategic engagement targeted only towards government peers and collaborative networks. The nuance and tensions in how external engagement is framed in these interviews suggests that values and value systems might play a significant role in determining when and how champions engage external networks and expertise for digital government processes. Aligning digital government research with more subjective, insider research on digital government processes (for example, Chadwick, 2011; Wirtz et al., 2016) would be advisable, and early work on public values in e-government might provide a useful framework through which to do so (Rose et al., 2015; Rose, Flak, & Sæbø, 2018), adding depth and theorization to the kinds of public/private sector distinctions drawn by Weerakkody et al. (2021) or the normative assumptions made by Meijer (2015).

Limitations

Several limitations are implied by the research design adopted for this analysis. Most obviously, this research is exploratory and the perspectives of the digital champions interviewed here cannot be simply generalized to other institutional or political contexts. These perspectives are nonetheless valuable as critical case incidences, as each innovator tells a deep story about their experiences that might have value for other digital government innovators (Ruddin, 2006), and we believe that the theoretical model has value for theoretical generalization in other contexts (Yin, 2009). Nor is it possible to assert the objective efficacy or impact of the strategies described here. While the respondents here are uniquely positioned as experts on their own role as digital champions (Meuser & Nagel, 2009), other methods would be necessary to evaluate the perspectives presented above.

Declarations of interest

I hereby confirm that there are no conflicts of interests relating to the funding sources for this research or other relationships.

The research for this article received support from the Beeck Center's Digital Service Collaborative and partial funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770356. This article reflects the views only of the authors only, and the Commission cannot be held responsible for any use which may be made of the information contained herein.

Acknowledgements

This research is based on interviews conducted during a scoping study for the Digital Service Collaborative, a project dedicated to cultivating the community of digital service leaders in the public interest technology ecosystem, and based out of Georgetown University's Beeck Center for social impact + innovation. The interviews were made possible through introductions by Sonal Shah and invaluable research support from Will Denison, Vandhana Ravi, Alberto Rodriguez, and Emily Tavoulareas.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.giq.2022.101681.

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