An overarching conceptual framework for ICT-enabled Responsive Governance

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Abstract

Over the recent years responsiveness has gained importance as it is a critical element of public governance processes and acts as a driving factor for supporting the achievement of governance objectives, especially in the implementation phases. In this study, we identify the knowledge gaps in the realm of responsive governance based on a systematic literature review. Based on our analysis, we propose a conceptual framework of major building blocks (input, process and outcomes) for the development and implementation of responsive governance at the local, regional and national levels of administrative hierarchy.

Keywords: *Governance, Service Delivery, ICT, Responsiveness, Citizen-centric, Value Co-creation*

1. Introduction

Policy makers and the public typically desire ideal outcomes from the implementation of any policy (Lipsky, 2010), wherein public governance mechanisms need to be responsive and accountable. However, experience so far suggests that policies seldomly translate linearly and their implementation is often affected by various external factors and is underpinned by information gaps. As such, policies often need to be adapted to address change and transformations taking place during the implementation phase. It is well known that external factors not only affect the shape and structure of policy, but also the expected policy outcomes (Von Holdt, 2010). Hence, government and policy makers experience a growing pressure to keep pace with the changing environment and to be responsive towards their citizens. According to Hartley (2006, p. 31) governance innovation (new forms of citizen engagement, and democratic institutions); are core to governments responsiveness that can help them anticipate and develop robust policies that meet the changing needs of the citizens and as a result increase the public value delivered by these policies (Ju et al., 2019; Linders, 2012). To achieve such responsiveness, one needs to sense and understand changes in the environment

(Janowski 2015, Weerakkody et al., 2011, Zamani et al., 2022), which calls for fundamental changes and major reforms in the structuring of the administrative processes and better linkages and alignment between government and the public (Todisco et al., 2021).

Greater awareness of the connection between business models and digital technology has led to the realisation that the public sector can implement targeted policy interventions to foster business model innovation that generates value for the government, industry, and the general public (Cabral et al., 2019; Klein et al., 2013; Agarwal et al 2021). With the growth in the innovations related to the use of Information and Communication Technology (ICT) and emerging digital technologies (Brynjolfsson and McAfeel., 2015; Svahn et al., 2017; Teece, 2018b), it is possible for government to disrupt and create unprecedented value through digital capabilities (Tonelli et al., 2017; Weill and Woerner, 2013), respond to the needs of the public on an urgent basis (Tomo et al., 2019) and engage a record number of people at a low cost by providing superior services (Fishenden and Thompson, 2012). Given these three objectives, there are two underlying concepts that may be exploited: the first is the use of digital platforms that foster innovation and the second is the utilisation of complementary assets to facilitate value creation (Teece, 2010).

ICT allows low-cost information sharing and has the potential of making citizens as well as governments more responsive (Prat & Strömberg, 2013). In addition, the use of ICT-enabled digital transformation in governance processes has helped governments to shift focus from a government-centred approach towards a more public-centred one (OECD, 2016). This is because ICT-enabled digital transformation can ensure smooth adaptations to unanticipated challenges and facilitate engaging with and responding to citizens' needs (Houston et al., 2016). In other words, ICTs have allowed government and policy makers to be citizen-centric by making public services more accessible and reliable (Castelnovo and Sorrentino, 2017; Pereira et al., 2017) and by improving citizen outcomes (Gil-Garcia et al., 2018).To date, however, the literature on ICT-enabled (or digitally enabled) responsive governance is characterized by fragmentation and low conceptual clarity, whereby concepts such as citizen-centric (e.g., Sareen et al., 2022), agile (e.g., Soe and Drechsler, 2018), adaptive (e.g., Janssen and van der Voort, 2016), and participatory (e.g., Batory and Svensson, 2019) are overlapping and used interchangeably. The use of ICT-enabled governance processes encourages the participation of citizens as co-creators in the public service administrative process; thus offering an effective, efficient, accountable and transparent administrative system (Devi et al,

2021). Some examples of ICT-led service delivery include that of *FixMyStreet*[1] in the UK and *SeeClickFix*[2] in US wherein users can report problems such as malfunctioning traffic lights, potholes in roads, garbage disposal issues etc. These issues are then passed on to the relevant party, e.g., the national council, the utility company or a local political representative. Email notifications are sent to citizens with status updates on their reported issue. By having access to a map of all issues reported in their neighbourhood, citizens are able to contextualise their concern. Citizens can also set up a "watch area" where they can get updates on local problems, which fosters a sense of community. Other less prominent examples include that of *OnTrack*[3] in Bolivia and *Ushahidi*[4] in Kenya. OnTrack enables marginalized rural families to make their voices heard by simply sending a text message from a cell phone that directly reaches the government's project team of the Rural Alliances programs. Ushahidi allowed citizens to use short message service (SMS) and e-mail to report acts of violence that were then mapped online. However, a shortcoming of these programmes is that they are limited to giving marginalised communities the power to speak up only when there is a need to support governments in creating institutional systems that incorporate their voices in the decision-making process. Thus, while governments across the world have made some advances in adopting digitally enabled business models, more efforts are required in their endeavours to enhance the responsiveness of government programs to people's real needs (Castelnovo and Sorrentino, 2017; Scott-Kemmis, 2018). The public sector-run LPG supply chain is one example of how key supply chain capabilities, such as an integrated and seamless ICT system, the detection and blocking of duplicate/ghost connections, the capping of entitlements, and collaboration and coordination across various stakeholders, have led to value creation for all stakeholders in a large, complex environment (Mittal, Agarwal & Selen, 2018). Nonetheless, the understanding of ICT-enabled responsiveness in the governance of public sector services is very limited, and improving the efficiency, quality and impact of public sector services are one of the most critical challenges for governance (Gelb, Mittal, & Mukherjee, 2019).

Against this backdrop, and in the absence of understanding of ICT-enabled responsiveness in the governance of public sector services, we use the Capability Approach and the Public Value theory to synthesise the extant literature on responsive governance with three main objectives: first, to clarify the concept of responsive governance, especially in relation to the role and

[1] https://www.fixmystreet.com/
[2] https://seeclickfix.com/
[3] https://latinno.net/en/case/2033/
[4] https://www.ushahidi.com/

participation of citizens; second, to unpack the role of ICT towards enhancing responsiveness and ensuring public value creation through a citizen-centred perspective; and third to identify and organise the major building blocks of ICT-enabled responsive governance into a framework of inputs, processes and outcomes that can inform the implementation and development of relevant policies. We thus formulate the following research questions:

1) What is responsive governance? What are its constituents?
2) How can we add value in public service delivery by ICT enabled responsiveness?
3) What are the benefits of implementing ICT-enabled responsiveness for policymakers?

We focus on ICT-enabled responsive governance processes to address the above questions through a literature review on responsive governance. We examined 45 peer-reviewed articles published in leading journals through the lens of the Capability Approach and Public Value theories to analyse these and inform our work. The Capability Approach argues that policies need to focus on citizen outcomes, by actuating citizens' ability to freely express and achieving their needs (Spence and Deneulin 2009). It thus allows us to understand the phenomenon of responsive governance from the citizen's point of view and to lay the foundations for guiding researchers and practitioners. The Public Value theory focuses on the governance processes, policy making and service delivery (Wallmeier et al, 2019) and enables us to explore value creation for the public as a result of responsive governance. Our work responds to recent calls for developing insights on how ICT and digitization can support public value creation for service delivery (Panagiotopoulos, Klievink, and Cordella, 2019) and enriches the current literature by providing theoretical clarity on responsive governance, its inputs, processes and outcomes. In addition, it informs policy makers and practitioners by providing a structured framework for developing and implementing ICT strategies that support responsive governance and create value in public service delivery, one which takes into consideration the capabilities of the involved stakeholders, particularly the citizen as an input provider.

The remainder of the article is organised as followed. First, we provide the theoretical underpinnings of our systematic literature review, offering an overview of the notion of responsive governance, Capability Approach and Public Value theory. We then describe the protocol followed for the systematic literature review. This is followed by the development and discussion of our conceptual framework for ICT-enabled responsive governance and its constituents. We then develop research propositions for guiding future research. We conclude the paper by highlighting the implications of our study.

2. Background

Public sector innovation is problem-driven (Windrum & Koch, 2008), has distinct obstacles (De Vries et al., 2016), and often fails to produce public benefit due to a lack of resources, skills, and capabilities (Hartley, 2005, 2006). There is pressure on governments to perform better because of rising expectations from citizens and the transformation from passive recipients to active participants in the creation of value (Chesbrough and Rosenbloom, 2002). As a result, governments are struggling to manage innovation (Green et al., 2014) as they are typically risk averse (Bommert, 2010) and highly bureaucratic (Hood and Peters, 2004). Further, the ability to solve "wicked" societal challenges (Rittel and Webber, 1973) is very limited, and "innovation often gets derailed" during the implementation phase of the innovation cycle (Eggers and Singh 2006, pp 6-7).

Despite that business model innovation in the public sector is limited (De Vries et al., 2016), governments are willing to collaborate with industry and stakeholders to orchestrate innovation (Crosby et al. 2017) and enable transformations (Martins et al., 2019). Research in recent years demonstrates that the public sector can introduce specific policy interventions to create government, industry, and public value through business model innovations (Cabral et al., 2019; Klein et al., 2013, Agarwal et al 2021). For example, the revolutionary effect of new digital technology on business models (Massa et al., 2017) and business model innovations is seen in the Indian LPG industry case (Agarwal et al, 2021).

In what follows, we discuss the role of responsive governance and ICT-enabled responsiveness to heighten innovation performance. We then provide the rationale for using Public Value Theory and the Capability Approach as a vehicle for considering more constructively, what is required to create value in the public sector.

2.1 Responsive Governance

Responsive governance requires responding efficiently and effectively to citizen's needs and fostering greater citizen engagement in governance processes[5]. This requires a commitment to anchor policies, strategies, programmes, activities, and resources in consideration of people's expectations, with a focus on local variances and ambitions[1].The role of responsive governance is important not only regarding the service effectiveness but also about the legitimacy of a government and the business model innovations they create. Especially for democracies, the role of responsiveness in the governance process is even more relevant and important to ensure creation of public value (Bryson et al., 2014), which places citizens as value creators at its core.

[5] Responsive and Accountable Governance. World Public Sector Report 2015. UN. https://doi.org/10.18356/eb2395c8-en

Further, at the heart of the 17 Sustainable Development Goals (SDG) lies the cluster of promoting peaceful and inclusive societies and building effective, accountable, and inclusive institutions ensuring a responsive, inclusive, participatory, and representative decision-making at all levels (Gelb et al, 2019); this adds additional significance in endeavours that position citizens at the core of governance processes.

Additionally, there are several examples in the literature where ICT and digitalization more broadly are leveraged to support responsive governance processes and to link citizens in a more direct way to public agencies (e.g., Panagiotopoulos et al. 2019). Indeed, thanks to the increased penetration of smartphones and broadband, citizens can interact with their local and national government in real time. However, despite the focus on public value creation and the large investments in ICT strategies, information systems and digitalization programmes, there is a gap between the actual and the expected outcomes of governance in terms of being accountable, responsive and transparent where ICT is involved in public services (Helbig et al., 2009).

2.2 Public value theory

There is an increased focus on 'public value' by both academics and practitioners. This focus heavily draws on Moore (1995) who provides a framework to understand the governance process, policy-making and service delivery for public value creation. Public value is a latent multi-dimensional factor that emerges through a complex process based on the preferences of citizens to generate expected outcomes of service ideals through accountability, efficiency, effectiveness and consistency (O'Flynn, 2005b). The theory proposes that along with the possession and the harnessing of various organizational resources based on organizational capabilities, there is a need for a sustainable process to ensure adapting and responding to the changing needs and social expectations, and to achieve public value creation (Alford and Hughes, 2008). Therefore, we argue that in order to create public value through ICT, there is a need to restructure relevant processes based on engagement, collaboration, experimentation, and learning among various actors (i.e., citizens, organizations, institutions, government entities), which can ultimately result in new business models and/or business model innovations.

2.3 Capability Approach

To date, several scholars have adopted Sen's ideas (Sen, 1999) as crystalized in his Capability Approach (Frediani, 2010). The Capability Approach focusses primarily on people's wellbeing

rather than their income and financial resources, contrary to most theories discussing development (Sen 1999). This is because traditional economics models make use of opulence-led approaches (e.g., based on income, commodity command) or adopt utilitarian-focused approaches (e.g., based on happiness, desire-fulfilment), which can be misleading. To address this shortcoming, Sen proposed that the capabilities (opportunities and abilities) of an individual can determine what this individual is able to achieve in terms of wellbeing and welfare, and that personal factors and other social arrangements are critical for the conversion of these capabilities into actual outcomes (Sen,1985).

Along these lines, people's freedom to make choices must be the central focus of the governance process such that citizens must be the provider of inputs (Vargo and Lusch, 2004) and must assume a key role in the planning, designing and development of public policy to ensure adaptations to their needs (Griewald and Rauschmayer 2014). In this sense, the Capability Approach can provide a framework that "could help transform or create different social, economic and political arrangements from the ones which deepen inequality, undermine people's opportunities to live well and destroy the environment" (Deneulin, 2014, p. 3). As such, leveraging this approach allows us to adopt a development-oriented view and consider how government and citizens may deploy their resources and generate the required capabilities to convert said resources into achievements in a context of responsive governance. We focus specifically on IT resources and IT capabilities owned and deployed by the government and citizens and how these can be used to ensure responsive action in the governance process for effective public service delivery.

3. Methods

In this study, our aim was to synthesise extant literature and existing knowledge regarding responsive governance with the view to clarify the concept of responsive governance, to analyse how ICT capabilities enhance responsiveness, value creation in governance processes and service delivery, and to identify the major building blocks of ICT-enabled responsive governance. The above call for a systematic literature review as this approach allows to review the existing literature and analyse it based on clear criteria that fit the scope of our research questions in a way that results can be reproduced and extended in the future (Webster and Watson, 2002). In this section, we describe step-by-step the overall research design we adopted. We followed the approach proposed by Tranfield et al. (2003), which is a robust and popular systematic literature review and builds on three phases: planning the review, conducting the

review and documenting the findings (Kaur and Gupta, 2022; Zamani et al., 2022). These are discussed next and summarised in Figure 1.

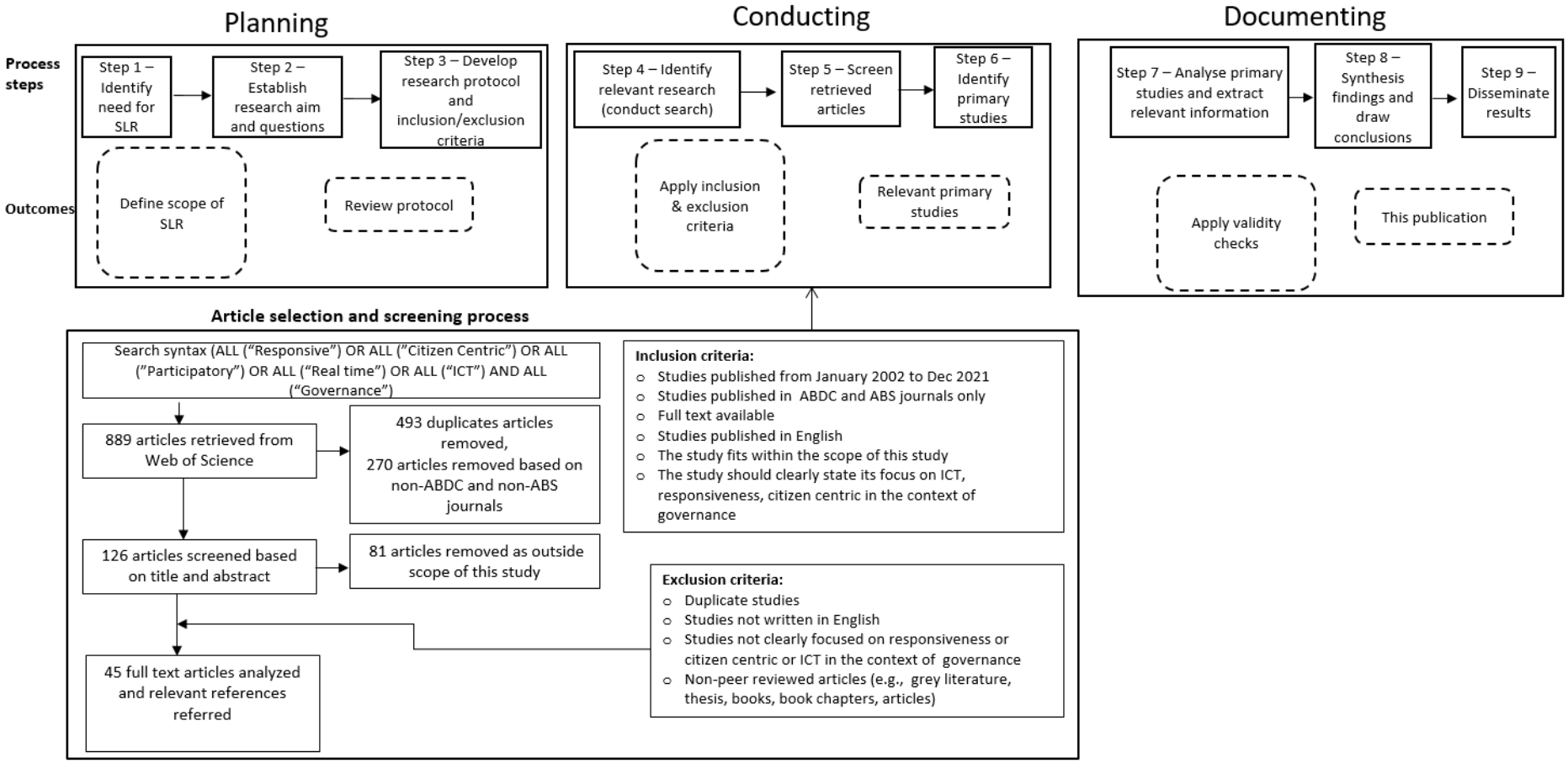


Figure 1. Research Methodology

3.1 Planning Phase

Before initiating the search for relevant literature, we defined inclusion and exclusion criteria to help us scope the literature and ensure that only relevant studies are included in the pool of papers for further analysis. These criteria are shown in Table 1 and helped the research team to remain focused on the study's research questions, and adopt a reliable and consistent approach to identifying and assessing studies. Namely, we were interested in studies that have been published over the last ten years and that have been published in major peer-reviewed academic journals. Due to the composition of the research team, all papers had to be published in English. Most importantly, all studies had to be clearly focused on responsiveness and ICTs within the governance domain and discuss or analyse citizen-centric perspectives.

Table 1. Exclusion and Inclusion criteria

Inclusion Criteria	Exclusion Criteria
Studies published between 2002 and 2021	Studies published prior 2002
Studies published in ABDC and ABS journals only	Non-peer reviewed articles (e.g., grey literature, theses, books, book chapters, articles)
Full text available	Full text not available (e.g., only abstract is available)
Studies published in English	Studies not written in English
The study fits within the scope of this study: The study should clearly state its focus on ICT, responsiveness, citizen centric in the context of governance	Studies that exhibit only superficial engagement with the focus of the study (e.g., cursory references to responsiveness)
	Duplicate studies

3.2 Conducting Phase

Based on the research objectives of our study and our prior knowledge of the governance literature, we identified the following terms to be used as keywords: 'real time governance', 'responsive governance', 'participatory governance', 'citizen-centric governance', 'adaptive governance', and 'citizen engagement'. We expanded this set of keywords by using related terms (e.g., 'participatory governance' AND 'ICT') to form search strings, which we later used to conduct our queries through the Web of Science (Table 2). This process resulted in identifying 889 studies; however, at this stage we had not yet applied our inclusion and exclusion criteria (Table 1) and we did not identify and remove duplicate studies either.

Table 2. Search strings used for querying papers

Search String	Search results
Real time governance	413 papers
Responsive governance	423 papers
Participatory governance & ICT	28 papers
Citizen-centric governance & ICT	5 papers
Adaptive governance & ICT	10 papers
Citizen Engagement & ICT	10 papers

3.3 Documenting Phase

We began our search in November 2021, following an iterative process where 889 papers were filtered according to our protocol and exclusion/inclusion criteria. Applying these criteria resulted in a pool of 126 papers. These were then screened for relevance whereby we reviewed their title, abstract and keywords. In addition, we conducted a forward and backward search to identify additional studies that could have been missed due to our protocol. This was done by examining the papers' reference lists and their citations (Badampudi et al., 2015). However, our search did not find any that met our inclusion criteria during the forward and backward search. Overall, the process resulted in eliminating 81 studies; thus 45 papers remained in the pool for further analysis.

4. Results

4.1. Descriptive Analysis

Overall, we reviewed 45 papers in terms of year in which they were published, research methodology employed, data used, economy of the country in which study was conducted, level of investigation, and type of the institution on which the study focussed. Most of these papers were published in 2013 (5 papers), 2020 (8 papers), and 2021 (6 papers) (Appendix, **Error! Reference source not found.** 1). With regards to the methods used, as shown in Appendix, Figure 2, most papers used qualitative techniques (26 papers). There were six conceptual papers and nine papers used quantitative techniques such as surveys. There was one critical review and the rest leveraged some type of experimental approach. In relation to this, the majority of studies draw from either primary data (18 papers) or secondary data (23 papers), with one study using both primary and secondary data (Appendix, Figure 3).

Regarding the focus of shortlisted papers, the studies were mostly focused on developed countries (25 papers), while 14 studies focused on developing countries (Appendix, Figure 4) with 19 studies being contextualised at a national level (Appendix, Figure 5). We also note that

typically studies seem to be focused on the citizens' perspective (14 papers) or that of a public/government organisation (11 papers), with several providing no specific perspective (7 papers) (Appendix, Figure 6).

4.2. Responsiveness in governance

The concept of 'responsiveness' is frequently discussed in the extant governance literature, but its meaning and the significance of responsive governance are rarely explicitly discussed. For example, over the years, studies have shown that especially during times of crisis and uncertainties and when risk of failure is high, responsiveness can mitigate some of the impacts because it enables an entity to be flexible and remain adaptive (Nielsen, 2016). Responsiveness then entails that the entity can collect and use new knowledge to adapt and respond to environmental changes. This is because, this knowledge is critical for shaping and informing the actions needed to respond to these changes (Nielson, 2016; Stirling, 2008a). Along these lines, scholars have indicated that responsiveness can be measured in different ways. For example, Vigoda (2002) suggests that responsiveness can be measured via the speed and the accuracy that characterise an entity's response to requests, e.g., how quickly a government responds to public demands and how well such a response satisfies the identified needs. This is a similar approach to that adopted by Pellizzoni (2004) who considers the reaction as a proxy for measuring responsiveness. In all cases, technologies can support entities to identify and meet the needs expressed by the public (Carroll, 1971), thereby they can facilitate responsiveness. Table 3 summarizes different responsive governance approaches from extant literature.

Table 3. Responsive Governance approaches in the existing literature.

Author	Findings
Carroll (1971)	Technology enables organisations to identify and meet the public's needs.
Collingridge (1980)	During times of high failure risks and high uncertainty, systems that are flexible and adaptive are required.
Ayres and Braithwaite (1992)	When there is difficulty in achieving regulatory compliance and government control is less, being responsive can help to achieve the objectives.
Johnson (1999)	Being responsive to uncertainty helps in being adaptive to changes. Constant adaptation helps in overcoming uncertainty.
Vigoda (2002)	Speed and accuracy are the two estimates to measure responsiveness. These parameters that measure the service provider's responsiveness to users' request for information or action. Speed relates to the time dimension of response or feedback by the government entities to the

	public's demand for information or action whereas accuracy estimates the whether the response by the public service provider fulfils the needs of its citizen.
Pellizzoni (2004)	Responsiveness can be measured by the ability to respond and the reaction generated to the public's demands. Adaptation and reflexivity are core dimensions to understand the ability to respond.
Stirling (2008a)	During governance failures, a government agency may know the root causes of said failure, but the knowledge actor that can respond to it may not be available. Such limited know-how may challenge the capacity to respond.
Fox and Ward (2008)	Being responsive reflects the ability of the government to acquire new knowledge and adapt to changing perspectives, new values and new norms quickly.
Nielson (2016)	It is important to know of the actors involved that allows the institution to prepare for the actions needed to overcome the challenges. The ability with which an institution responds and reacts to the challenges caused by internal or external processes defines the responsiveness of the institution.

Based on Table 3, one can infer that public institutions need to build and expand their knowledge structure by incorporating contextual knowledge in order to improve their responsiveness. Doing so can support effective decision making especially when addressing citizen needs (Liberatore and Funtowicz 2003). However, there is a growing need to evolve beyond the generic form of public governance by linking the existing knowledge with the expert knowledge that allows a public institution to effectively respond to and solve complex challenges. To do so, it is crucial to understand the role of ICTs and technological innovation and how these can integrate into the governance processes and deployed to provide effective solutions to the complex challenges that public entities face today, as well as fit best to meet the specific needs of their citizens in a particular context (King and Cotterill, 2007).

4.3. Participatory, Adaptive and Responsive Governance

With the paradigm shift towards the public's needs, concepts like responsiveness, participation, public value, and inclusiveness have gained prominent attention in the governance research domain (Scott, DeLone, & Golden, 2009). We note, however, that the domain of responsive governance lacks conceptual clarity. Adaptive, participatory and responsive are concepts that are often used to describe governance that emphasises the needs of citizens, but all three are closely related and to an extent overlap each other. In the context of governance, it is important to compare and distinguish between these three types of governance to understand their unique characteristics and effects on policy outcomes. Responsive governance is related to, but conceptually distinct from, participative governance and adaptive governance, and requires

different institutional arrangements, policy frameworks, and stakeholder engagement mechanisms. Comparing them and explicitly comprehending responsive governance will help uncover its important characteristics and strategies.

Participatory governance places citizens at the centre of the governance and public policy process. It is based on the principle that if citizens are placed at the centre of the decision-making process of public policy, then the resulting policy can effectively cater to their needs and desires regarding public services (Turnhout, von Bommel and Aarts, 2010). Citizen participation helps in delivering tailored public services and better adaptation to the public demands, whereby the very process of participatory governance enables citizens to be better informed and to contribute to public service delivery (Speer, 2012). At the same time, participatory governance ensures improvements in accountability (De Guimarães et al. 2020).

Adaptive governance is one the emerging forms of governance and focuses on effective resource allocation for sustainability during times of uncertainty and within complex environments, like natural disaster, extreme weather and financial crises (Janssen and der Voort, 2016; Folke, 2006; Maldonado et al., 2010). This approach involves interactions between various actors such as local networks, organisations, and institutions to achieve socio-economic balance and resilience (Chaffin, Hosnell and Cosens, 2014). This is particularly relevant for large scale contexts and variegated socio-economic landscapes, where informational gaps in policy making are inevitable and contribute towards a need for great adaptations (Taeihagh, 2021).

Finally, responsive governance aims to meet and to adapt to the dynamic needs of citizens by ensuring timely information access to public agents and citizens. However, to achieve this, it is important that the government maintains a network through which policy makers and public services in general can learn about the needs of the public (Hyle, 2016), and close the information loop by responding and feeding back to citizens regarding actions taken or not taken. On the one hand, this improves the governance process itself by making it more transparent and equitable for its citizens (Fischer, 2012). On the other hand, it requires that ICT, information systems and IT strategies more broadly are fit for purpose and their use can ensure the creation of such a network (Porcaro, 2022).

The differences and similarities between participatory, adaptive, and responsive governance are summarized in Table 4 which enables us to better identify the objective, drivers, process, context, and outcomes of responsive governance. Understanding these subtle differences and similarities also inform policy and institutional design by revealing stakeholder values, leading to more effective and responsive governance mechanisms.

Table 4. Comparison among Participatory, Adaptive and Responsive Governance

	Participatory	Adaptive	Responsive
Objectives	Solicit citizen needs	Adapt to citizen needs	Respond and adapt to citizen needs
Drivers	Knowledge Capabilities	Local network Capabilities	IT Capabilities
Process	Citizens as representatives	Local representation	Transparency and public disclosure
Context	Collaborative environment	Resilience, complexity and uncertainty	Dynamic environment
Outcomes	Improved performance to meet needs	Overcome challenges in agility	Ensure quality and access to services

5. Constituents of Responsive Governance

The constituents of responsive governance are the underlying elements, principles and practises that allow a government to address the concerns of its citizens effectively and efficiently. These constituents ensure that the government is transparent, accountable, inclusive, and adaptable to society's changing dynamics. The main constituents of responsive governance include:

5.1. Government Resources

One of the most important preconditions for responsive governance is the effective and efficient use of government resources (Koliba et al., 2017). Examples of such resources include the policies and regulations at the national, regional, and local levels of government, the strategies and plans used to implement them, as well as the financial and human resources and cutting-edge technological systems used by them. Building on the structure of the different levels of government allows us to select the suitable resources that might be considered representative of government resources. Then, we classify the most important types of resources, both tangible and intangible.

5.1.1. Levels of Government

Levels of government have been classified as national, regional, and local on a geographical scale (Koliba et al., 2017). There are mechanisms and provisions at all three levels of government for allocating and reallocating resources. Nonetheless, difficulties in coordinating between the three tiers of government are not new (Bryson et al., 2006). A higher level of participation from all levels of government is necessary for effective resource governance. In the context of resource management, each level necessitates the performance of particular obligations within the confines of the territorial constraints.

5.1.2. Policy/regulation

The term "policy" refers to the collection of rules and regulations that administration uses as a roadmap for carrying out the governance process for societal good. Policies are formulated by national, regional and local governments in an effort to adjust to the shifting conditions of their respective environments. These policies address both existing policy concerns and the emergence of new societal concerns. All levels of government, including the local, regional, and national levels, are imbued with the authority to exert influence in the policy formation and execution processes.

5.1.3. Strategy and Planning

Strategy consists of policy outcomes and procedures. It is a thorough, comprehensive blueprint of everything necessary to reach the intended target (Zerbian and Luis Romero, 2021). It is essential to maintain an overall strategy coherence across all levels of governance in order to prevent unfavourable outcomes. Government institutions should ensure decisions alignment with the agreed strategic plan. The research on strategic planning has shown that IT strategic planning has a greater applicability in responsive governance (Dufner et al., 2003).

5.1.4. IT resources and IT capabilities

In the traditional ICT-enabled governance model, digital technology is primarily employed for digitizing existing governance processes. However, there is paradigm shift that aims at delivering transformational arrangements in the governance process to make governance itself more responsive to the dynamic needs of citizens (Tapscott, 2007). The use of ICT and IT strategies allow improved participation among stakeholders involved in the governance process that guides the formation of public policies (Bekkers, 2004). IT resources can be defined as both assets and capabilities (Wade and Hulland, 2004). In the public service delivery process, the IT resources act as an input that can affect the capability of service delivery based on the amount and cost of input. In turn, investments in IT resources help to implement IT strategies (Santhanam and Hartono, 2003). IT innovations can act as fundamental drivers of the governance process and policy implementation for the effective public service delivery process. As such, there is a need to develop IT capabilities to cope with the transformation brought by IT innovations. These IT capabilities can be defined as “a firm’s ability to mobilize and deploy IT-based resources in combination or co-present with other resources and capabilities” (Bharadwaj 2000., p.171). Pavlou and El Sawy (2006) identified three key dimensions of IT capability, namely: the acquisition of IT assets, deployment of IT assets

through tight IT–business relationships, and leveraging of IT assets in formulating business strategies. Once an organisation is able to integrate the IT resources to achieve value proposition, these IT resources become IT competencies (Wu, 2006). However, this entails that the organisation imparts training to its employees and that it restructures its process to bridge the gaps between needs and capabilities.

5.1.5. Industry collaboration

Researchers have stressed the importance of public-private cooperation and the regular involvement of industry to achieve effective governance (Srensen and Torfing, 2011; Torfing et al., 2019; Torfing et al., 2019). Incorporating industry into governance processes improves policy implementation, processes, and outcomes by bringing in varied resources, experience, capabilities, and views, which can aid in understanding and addressing the difficulties encountered by the public sector (Klijn et al., 2010). Srensen and Torfing (2011) and Agarwal et al (2021) both highlight the significance of networks and partnerships among the public sector, industry, and other stakeholders in fostering an environment conducive to development and value creation. Industry involvement in the responsive governance system can facilitate the formation of such networks and partnerships. Therefore, government-industry partnership produces a more efficient, responsive, and sustainable governing process (Torfing et al., 2019).

5.2. Citizen Resources

Citizens' resources play a significant role in the co-creation of responsive governance. Citizens' propensity to participate in responsive governance is significantly influenced by citizen resources (Meijer et al., 2012; Scholl & Scholl, 2014). By recognising and utilising these resources, governments can engage with citizens more effectively and facilitate informed decision-making (Porumbescu, 2016). Based on a review of the relevant literature, we have identified five essential components of citizen resources:

1. *Knowledge:* Citizen knowledge entails a person's acquired knowledge of government services. Knowledge of government services, policies, and procedures by citizens is crucial for their engagement in governance processes (Cegarra-Navarro et al.,2012). Norris and Reddick (2013) assert that the level of citizen knowledge can have a substantial effect on the effectiveness of e-government initiatives. A citizen who is knowledgeable is more likely to participate in informed conversations and decision-making processes, thus contributing to the improvement of a responsive governance system (Scholl & Scholl, 2014).

2. *Skills:* Sandoval-Almazan and Gil-Garcia (2012) stress the significance of IT skills in supporting citizen involvement in responsive governance. Citizen skills refers to the extent to which government services stimulate citizens to develop their abilities (Porumbescu, 2016). Due to a lack of suitable IT skills, the majority of people are unable to fully participate in digital spaces (Hernandez and Roberts, 2018). The absence of IT skills is a barrier to participation, and as a result, it has a negative impact on the efficient delivery of public services, which hampers the realization of value (Agarwal, 2001).
3. *Creativity:* Citizen creativity is the creation, ideation, or development of original, advantageous thoughts, processes, or approaches to service-related challenges. Cegarra-Navarro et al. (2012) highlight the importance of citizen creativity in generating creative ideas for responsive governance. Creativity is vital to responsive governance because it enables citizens to contribute creative ideas and solutions to public problems (Nam, 2012). Encouragement of citizen creativity can result in the creation of new approaches and practices in governance, resulting in a more resourceful and responsive government. By offering platforms and incentives for citizens to co-create and participate in the planning, implementation, and problem-solving (Meijer et al., 2012).
4. *Connectedness:* Connectedness refers to the number, richness, and arrangement of an individual's interpersonal connections with other citizens. Sandoval-Almazan & Gil-Garcia (2012) stress the significance of connectedness in facilitating the interchange of information and ideas between citizens and the government. Connectedness helps facilitate the exchange of information, collaboration, and mobilisation to address public issues (Meijer et al., 2012). Strong connectedness can strengthen the capacity of citizens to participate in governance processes by developing relationships and establishing ties amongst community members (Sandoval-Almazan & Gil-Garcia, 2012). Thus, connectedness can play a pivotal role in promoting citizen involvement and fostering a more responsive governance (Sandoval-Almazan & Gil-Garcia, 2012).
5. *Technology readiness:* Technology Readiness is defined by Parasuraman (2000) as a measure of an individual's willingness to embrace technology. Technology readiness takes into account both enablers and obstacles that indicate an individual's propensity to adopt a new technology. In the context of e-government and modern public services, technology readiness is a critical component for the co-creation of responsive governance (Norris & Reddick, 2013). Bonsón et al. (2012) emphasise the importance of technological readiness in defining citizens' ability to co-create value with the government.

5.3 Public Value Co-creation

One of the most important tasks for government is to increase the effectiveness, efficiency, and quality of public services (Gelb et al., 2019). Co-creation of public service value, which refers to the delivery of quality services by the government in partnership with citizens, is an excellent approach for aligning citizen expectations with the quality of government service delivery (Greenhalgh et al., 2016). By fostering relationships between governments and their constituents, services value co-creation has the potential to "move government beyond the ivory towers" and provide citizens with responsive services. Successful public service value co-creation comprises a robust framework that enhances the system's accountability, efficiency, effectiveness, and consistency in order to enhance the citizen value through the higher integration of government and customer resources.

The concept of 'co-creating value' arose independently in several different disciplines, including business, design, innovation, and society development. These different studies share a few similar underpinnings (Greenhalgh et al., 2016), which are also visible in responsive governance. The key principles include: *First*, a multi-stakeholder perspective (assuming nation, regional, and local governments, its institutions, IT infrastructure providers, and citizens); *Second*, the enhancement of people's experiences is at the core of it; *Third*, an emphasis on process (the framing of the policy, strategy, planning, governance, and IT facilitation arrangements); and *Fourth*, integration of resources (by boosting citizen participation and figuring out how to increase their willingness and ability to do so, as well as improving the government's efficiency, effectiveness, consistency, and accountability).

Co-creation studies on governance made strong claims for sustainable societal impacts resulting from collaborative, empowering, engaging and adoptive interaction between government and citizens (Zurbriggen and Lago, 2019). Thus, value co-creation has a great potential for societal wellbeing contingent upon process (collaboration, empowerment, engagement, and adaptation) and outcomes (accountability, efficiency, consistency, and effectiveness) (O'Flynn, 2005b).

6. Discussion

The literature suggests that isolated resources are unable to create value but have a potential to do so if they are utilised in the appropriate setting and integrated with other assets (Vargo and Lusch, 2004). As a consequence of this, responsive governance makes use of all resources, and

more specifically, the resources of both the government and the citizens by integrating them for the purpose of bettering the governance and well-being of citizens.

As evident from the literature, to create public value through responsive governance, there is a need to restructure relevant processes based on engagement, collaboration, experimentation, and learning among various actors (i.e., citizens, organisations, institutions, and government entities). We build on the hierarchy of governance, which consists of national, regional, and local levels, to select the suitable government actors and resources that might be indicative of the entire government resources. Major tangible and intangible government resources can be identified as the instruments of policy, strategy, and planning used by the government. In addition, because ICT and digitalization in general are used to support responsive governance processes (e.g., Panagiotopoulos et al. 2019), ICT capabilities and ICT resources are conceptualised as intricate combinations of intangible and tangible resources that work synergistically to forge a robust system. This is because ICT and digitalization in general are leveraged to support responsive governance processes.

To generate public value, it is essential for citizens to play an active role in governance and maintain an ongoing participation in the use of their own resources in conjunction with those of the government. This will help to ensure a strong governance that is responsive to its citizens (Bryson et al., 2014). However, our review indicates that one of the most significant obstacles that government agencies must overcome is maintaining engagement with their stakeholders, most importantly with the citizens of their jurisdictions, because this can be a time-consuming and difficult process, particularly when it takes place in more traditional physical settings (Guo et al., 2020). As a result of this difficulty, citizens may feel alienated from government and develop resentment toward those who hold public office (Buntaine et al. 2017). Because of this, it is indeed an essential to address the problem by increasing the level of awareness and involvement between citizens and their government, doing so would help policy initiatives in being relevant and accurate. The government should investigate means of raising consumer readiness and capability to improve co-created value. ICT is a great instrument for this goal, particularly considering the growing popularity of smartphones and the general trend toward digitization as a whole.

Specifically, information technology resources and interactive public platforms like social media, online public forums, and other mediums, combined with information technology capabilities at both ends of the value chain (government agencies and citizens), have the potential to become the force that drives continued public engagement (Guo et al., 2020; Wang et al., 2021). Capabilities for public involvement can thus encourage ongoing communication

and cooperation amongst all parties involved, boosting the process of information exchange and the resulting opportunities for learning and growth (Houston et al., 2016). We therefore propose that ICT strategies that support the use of IT resources and enhance IT capabilities can advance the creation of public value as well as other values, such as participation, flexibility, responsiveness, adaptability, and trust. The ongoing interaction of government resources and citizen resources will, in the end, result in the co-creation of value that is shared by the government, society, and the individual citizens.

6.1. A Conceptual Framework for ICT-enabled Responsive Governance

In the previous sections, through a systematic literature review on responsive governance, we found a lack of conceptual clarity and integration of ICT components in responsive governance. We also identified the overemphasis on the supply side dimension (i.e. what the government does for its citizens) (Sørum, Medaglia, & Andersen, 2009) and the insufficient attention paid to the demand side (i.e., how citizens engage with governance).

We therefore present a conceptual framework for ICT-enabled responsive governance, drawing inspiration from the *public value theory* and *capability approach* (Figure 2). These theories emphasize the importance of individuals' capabilities to convert resources into valuable outcomes, highlighting the significance of both government and citizen-held resources in developing responsive governance. This framework aims to elucidate the roles and relationships among the constituents involved in ICT-enabled responsive governance and demonstrate how it can act as a catalyst for translating government- and citizen-held resources into both public benefits as well as stakeholder value. We propose that responsive governance facilitated by ICT has the potential to be the accelerator that converts government and citizen-held resources into tangible advantages for the government and the society at large. The proposed framework constitutes of inputs, processes, and outcomes.

6.1.1 Inputs

a) Resources and Capabilities*:* To enable ICT-enabled responsive governance, the suggested framework indicates that both government and citizens must have access to specified resources and capacities. These resources include IT resources and IT capabilities, strategies and policies at the government level, as well as the resources of the citizens.
b) Administration, actors, and policy: Although not explicitly specified in the proposed framework (Figure 2), it indicates the presence of three primary inputs: administration, actors, and policy. *Administration* comprises local, regional, and national authorities and

institutions. These entities have the authority to exert influence over policy implementation, governance procedures, and the development of polices. Important administrative resources include IT resources and IT capabilities, as well as directives that support their efficient use. Actors represent range of stakeholders, such as the government, the private industry, citizens, and institutions. *Actors* can participate in the governing process and co-create societally beneficial value with the administration. In addition, they can contribute to the governance by enhancing service delivery. The set of rules and regulations that direct the administration in carrying out the governance process for the benefit of society is known as *policy*. Policies have a vital role in shaping the capabilities of both administration and actors, since they facilitate the use of ICT in governance processes by fostering an enabling environment.

6.1.2 Processes

a) Conversion of Resources*:* The availability of these resources is required, but insufficient, to realise the benefits of responsive governance. The essence of responsive governance is to facilitate the conversion of resources into benefits, enabling the government to respond effectively to citizen participation in relevant processes. The conversion of resources to responsive governance outcomes is based on collaboration and interaction among the input entities:

Administration-Actors Interaction: The interaction between the administration and actors is characterised by a reciprocal exchange of authority and resources. Actors entrust their authority to the administration via political institutions, whereas the administration is accountable for fulfilling the needs and preferences of actors in policy formulation and implementation. ICT-enabled feedback loops facilitate this interaction by providing a platform for actors to voice their opinions and for the administration to respond accordingly.

Administration-Policy Interaction: The interaction between administration and policy is that of guidance and adherence. In implementing governance procedures, the administration is required to conform to existing policies and regulations, and it may also contribute to the establishment of new policies that better match with societal preferences.

Actors-Policy Interaction: The interaction between actors and policy is characterised by the impact of actors on the formulation, modification, and evaluation of policies. Actors can push for changes to existing policies or propose new ones through their engagement in

the governance process. They can also provide feedback on the efficacy of existing policies, which may result in additional policy modifications.

b) ICT-Enabled Loops*:* ICT-enabled loops play a crucial role in the proposed framework because they enable citizens to access appropriate information, interact in governance processes, and drive government commitment to resolving citizens' concerns, learning from them, and fixing any policy inadequacies.

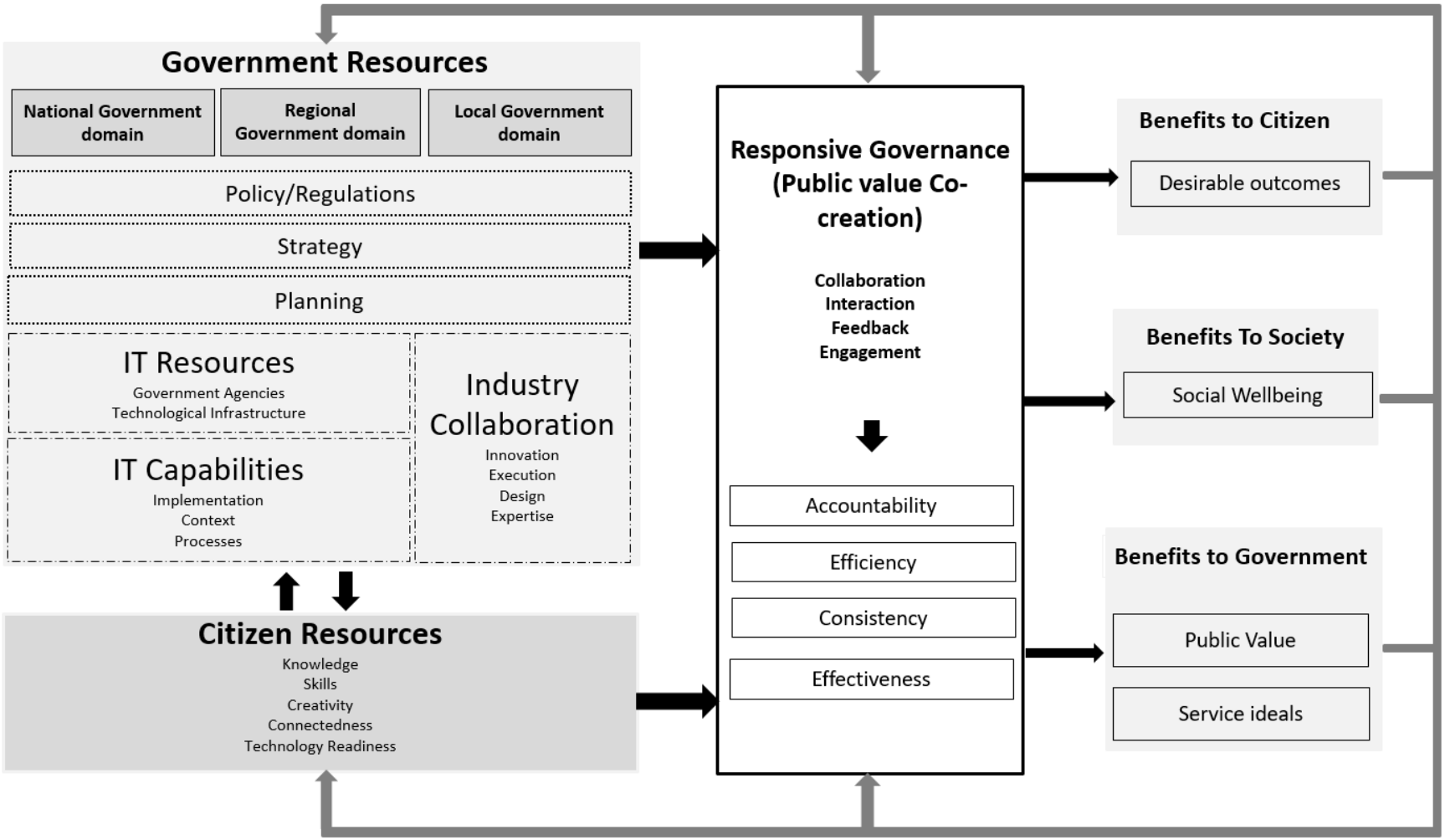
6.1.3 Outcomes

The proposed conceptual framework for ICT-enabled responsive governance has outcomes such as development of public value and the attainment of desirable societal value, and the enhancement of public service quality (Gelb et al., 2019).

a) Enhanced Citizen Engagement*:* The framework supports enhanced citizen participation in government processes by equipping actors with the required resources and competencies, such as technological readiness, skill, knowledge, creativity and connectedness. This active engagement facilitates a more inclusive, transparent, responsive, and democratic decision-making procedure.
b) Improved Responsiveness to Societal Needs*:* ICT-enabled feedback loops help administrations to better comprehend and respond to citizens' wants and preferences, resulting in more effective and specialized policies and services that meet societal issues.
c) Continuous Learning and Adaptation*:* The continuous interchange of information and feedback between administrations and actors, enabled through ICT feedback loops, promotes a culture of continuous learning and adaptation in governance processes. This ability allows the administration to identify and address policy deficiencies, resulting in continuing enhancements to the delivery and outcomes of government services.

The proposed conceptual framework for ICT-enabled responsive governance aims to fill gaps in the existing literature by providing a clear and comprehensive understanding of the role of ICT in strengthening the responsiveness of government agencies. By building on the capability approach and analysing the relationships among administration, actors, and policy institutions, the framework provides an integrated platform for guiding future research and practice on responsive governance.

Figure 2. Framework for ICT-enabled responsive governance



6.2. Propositions

In this section we discuss five propositions which we developed based on our literature review and the framework for ICT-enabled responsive governance. These aim at informing future research around ICT-enabled responsive governance.

Proposition 1: Governments can be more responsive and enhance interactions with local, regional and national stakeholders by employing ICT tools for citizen engagement.

In the digital era that we are living in, the use of interactive social media platforms like Twitter, Instagram, online public forums, Facebook, and blogs by government agencies can enhance effective information sharing between public agencies and its citizens. This is because, such ICT tools allow government entities to reach their citizens in shorter times, be responsive to their needs, and communicate relevant and quality information (Houston et al., 2016). In addition, the affordances and the effectiveness of these tools reinforce their use (Guo et al., 2020). As a result, such ICT tools enable connectedness with citizens, foster better collaboration, whereby citizens together with government can co-create value (de Jong ey al., 2019), and allow governments to overcome cost constraints and IT resources limitations (e.g., when an entity needs to communicate a decision to a large population) and to receive timely feedback from citizens. In turn, as these tools bring citizens' needs to the attention of policy makers and facilitate a more straightforward two-way engagement (Choudrie et al., 2017), government and agencies can become more responsive.

However, power dynamics, hierarchical structures, and organisational values and norms often influence decision making in terms of whether and how a government adopts an online platform for interacting and engaging with citizens. While traditional governance decision making is driven primarily by vested interests, responsive governance tends to leverage digital platforms, which allow for learning from their citizens (Manza & Cook, 2002). Aspects of the above have been earlier examined by Choudrie et al (2017) during a study in Oman. Specifically the authors examined with Omani agencies have been using Twitter, as well as the justifications behind doing so and the implications. They found that, on the one hand, Twitter allowed a two way interaction between agencies and citizens, and that on the other hand, Twitter itself was chosen over other platforms specifically because it afforded succinct and real time information to be communicated both bottom-up and top-down. While shortcomings are also reported (such as government officials feeling overwhelmed), processes were streamlined and agencies' responsiveness overall improved.

We thus propose that government entities that wish to become more responsive should consider the use of ICT tools that allow for digital collaboration, interaction and engagement with citizens and other stakeholders and in real time, rather solely a one-way communication with information being shared top-down only.

Proposition 2: Citizens can engage with and contribute more towards value co-creation when governments engage in ICT-enabled information sharing.

The citizens' perspectives regarding the availability and the delivery of public services are crucial for the public sector, and even more so for value creation and co-creation (van Duivenboden and Thaens, 2008). It can thus be assumed that there is an implicit duty for citizens to provide feedback on government initiatives and functions, based on the assumption that such feedback, especially when constructive, will create a sense of responsibility in public administration, and that it will make the latter more responsive, who will pursue ongoing improvements to the governance processes.

However, existing literature indicates that citizens can be more responsive only when they have access to information, that will enable them to do so (Prat & Strömberg, 2013). Indeed, Lee-Geiller and Lee (2019) have argued that the democratic process and citizen engagement necessitates significant information sharing from the government side. In relation to this, while ICT has nurtured such citizen-government relationships (Von Hippel, 2005), there is still a need to open up the use of available ICT resources – this can turn citizens from passive information seekers to partners in the co-creation of public services (Janssen & Estevez, 2013). This, however, requires relevant ICT strategies and policies.

While there are different approaches to achieve this, Chen et al (2021) provide an interesting example. Based on the Social Sharing of Emotion theory, the authors examined whether citizen engagement increased during the pandemic as a result of ICT-enabled government campaigns focused on information sharing. The authors found that information-rich and emotive video sharing fosters greater engagement and accelerates information dissemination overall (Chen et al., 2021). While such engagement does not necessarily lead to value co-creation, Guenduez et al (2020) argue that this is still possible because citizens indirectly participate in government service delivery, through their actions as well as their data.

We therefore suggest that citizens' engagement with governance processes requires information sharing to facilitate decision-making processes and models that are informed by the principles of accountability, transparency, and democratic values and norms (Stamati, Papadopoulos and Anagnostopoulos, 2015), and this in turn can lead to value creation (Bertot

et al., 2010). We thus propose that ICTs can be used to support citizens in engaging with governance processes through ICT-enabled information sharing, so that public service delivery mechanisms improve through responsiveness and value co-creation.

Proposition 3: ICT-enabled feedback loops between citizens and governments support value creation and increased responsiveness.

Citizens often view government entities as service providers and often provide feedback regarding the quality of such services by interacting with said entities. However, this feedback loop can be most successful when the government has effective governance mechanisms in place to engage citizens in their processes and local affairs more broadly. The findings of a study revealed that ICTs influence the core functions of public administration and the characteristics of ICTs steer governments in the direction of more control over society (Meijer, 2007, Page 3). We extend this argument to propose that the interaction between government and citizens can be facilitated using ICT, which may take different forms, for example, user generated content on social media, discussions in online community forums, and online reviews on government products and services.

In more detail, government agencies can leverage advanced but easy to implement methodologies to process feedback and comments, and user generated content more broadly, that pertains to their service delivery; subsequently, they can leverage the results to inform future activities. Lee et al (2021) for example propose a topic modelling technique for the classification of comments gathered via social media for the British National Health Service (NHS), whereby these were then analysed using the SERVQUAL dimensions and sentiment analysis. Similarly, Wan et al. (2016) propose the use of an interface that has been designed specifically for monitoring web and social media content and which allows the user to decide on what queries to run and which uses natural language processing techniques to analyse the text in a way that helps the user (i.e., the agency employee) to decide whether and how to engage with the citizen. Irrespective of the approach followed for engaging with feedback from online social media, its processing allows, on the one hand, citizens to be co-creators of services and policies, and on the other hand, government entities to be more responsive to local needs, creating a virtuous loop. In addition, such feedback mechanisms foster responsiveness in governance and government-to-citizen and citizen-to-government collaborations (Linders, 2012).

In other words, leveraging and configuring ICT capabilities can lead to substantial value co-creation whereby citizens and government entities both contribute towards designing, delivering and improving public services (Namisango et al., 2022). We therefore propose that ICT can provide the baseline for value co-creation between government entities and citizens towards improving service delivery, through a virtuous feedback loop, whereby this in turn increases governance responsiveness.

Proposition 4: IT Capabilities (internally developed or acquired) can enhance the responsiveness of the governance process to deliver public value.

The various factors that contribute to the deployment of ICT in any organisation relate to contextual factors, institutional characteristics and available resources. Not all government entities possess the capabilities that can allow them to fully harness their IT resources (Cabral et al., 2012). If such capabilities do not exist within the organisation, it is very likely that the various public ICT will work in isolation from each other, thus counteracting value creation. As such, it is critical that government entities, either acquire or develop the relevant capabilities with the view to meet continuously evolving citizens' needs and technological requirements. When internally developing dynamic capabilities is not possible, there are other ways, such as reconfigurations and restructuring, that can facilitate said capabilities (Page et al., 2021). For example, government entities may leverage co-creation techniques, their networks, and collaboration among actors (Klievink et al., 2016). In addition, such capabilities may be acquired through partnerships with industry actors, whereby government entities and industry engage in knowledge exchange through collaboration and cooperation activities, and this process can lead to better understanding the ecosystem as well as addressing citizens' needs (Pappas et al., 2018). In many cases, the above can be achieved through public-private partnerships, especially when there are increasing dependencies between service provision and infrastructure (Lips et al., 2023). The Government of India, for instance, launched a unique identification programme in 2006 as a flagship initiative to transform India into a digitally empowered society. This programme comprised three key components: a public-private collaboration that developed IT infrastructure and capabilities as a utility, on-demand governance and services, and digital empowerment of citizens. This initiative (popularly known as Aadhaar programme) uses biometric and demographic data to assign a unique 12-digit identity number to every resident of India. This effort has increased transparency, reduced corruption, and enhanced the delivery of public services (Madon et al., 2022). Mukhopadhyay

et al. (2019) found that Aadhaar programme has made the Indian government more accessible and responsive to poor citizens' needs.

However, resources are always bounded and constrained, and there are limitations with regards to the capabilities when these are acquired through partnerships or collaborations (e.g. data sharing, costs, flexibility and accountability). We thus propose that complex ICT-enabled government initiatives need to be based on developing dynamic IT capabilities (Agarwal and Selen 2009; Sher and Lee 2004) in response to the volatile, uncertain, complex and ambiguous environments, as well as public expectations arising from rapidly changing emerging technologies, both of which enhance public value creation.

Proposition 5: Citizens' Technological Readiness influences their ability to respond

Being able to gauge the technological readings of the citizens, possibly through the use of the Technology Readiness Index (TRI) can inform government entities and practitioners more broadly with regards to which ICT can be effectively deployed and to what extent citizens can use them as part of their relationship with the government. The pace at which such ICT systems can be implemented and the education and support needed to ensure citizens can make use of such ICT systems needs to be identified as part of crafting and implementing ICT and/or digital strategies (Parasuraman, 2000). Therefore, we consider important that government entities and the public sector more broadly carefully consider the technological readiness of the citizen cohorts they wish to serve. Different readiness levels will support sophisticated ICT solutions for engaging with the public (Kasimati et al., 2013).

Assessing at scale the technological readiness and the digital skills of citizens is not always easy to do and it requires significant resources and effort. There are however ways to approximate these at high level. Zamani and Vannini (2022) for example used publicly available datasets to produce a place based approach to map digital poverty across the South Yorkshire region in the UK, whereby digital poverty can be used as a relatively good proxy of digital skills, technological readiness and digital exclusions more broadly. This type of reporting allows government agencies to identify and appreciate the restrictions, local barriers and most disadvantaged areas within a region in terms of technological readiness. On the one hand, such insights can be used to put together initiatives to combat digital inequalities, but on the other hand, and for the purposes of this study, agencies can tailor their provision to the actual capabilities on the ground.

Therefore and while it is critical that government entities assess technological readiness at different points and on an ongoing basis, so that they can adapt the mode of delivery, they also

need to consider alternative ICT tools and solutions, and even innovative means of communicating with citizens with the advancements in technology, so that they can maximise their ability to respond.

7. Conclusion

In this study, we propose a framework for responsive governance enabled by ICT emanating from the Capability approach and Public value theory and put forward five propositions for informing future work in this domain. This framework is informed by a structured literature review and operates at three levels of administrative hierarchy, namely local government, regional government and national government comprising government resources, citizen resources, service value co-creation, and benefits to citizens, society and government.

The resulting conceptual framework aims at guiding practitioners and policy makers by offering a structured approach towards building responsiveness in governance. Practitioners and policy makers can leverage this framework to identify the existing IT resources and IT capabilities that are needed when designing IT strategies. In addition, the framework informs them on how to develop effective feedback mechanisms for engaging citizens in decision making processes and enabling responsiveness on their end so that citizens can influence and inform policy making and resulting outcomes. Thus, our work can guide the design of IT strategies based on stakeholders' capabilities more broadly.

Our work comes with certain limitations. In this study, the presented framework has been developed based on a structured literature review that helped us identify the current state of the art. In designing our structured literature review, we primarily focused on 'responsive governance', and explored 'participatory', 'citizen-centric', 'real-time governance', 'adaptive' and 'ICT governance', which we used as keywords during our queries. We chose this set of keywords, because these are terms that are often used interchangeably with the term 'responsive governance'. However, we consider that a more comprehensive search may be possible by using additional keywords, informed by the concept of responsiveness in a broader sense, possibly including accountability. While we differentiated the salient features of responsive governance from participatory, and adaptive governance, future research can further establish the discriminant validity of responsive governance. In addition, we stress that the proposed framework is theory driven and has not been empirically tested. As such, we consider that the next step would be for future scholars to validate the relevance and applicability of this framework at the local, regional and/or national level. We consider that this could be possibly

done through expert interviews and case studies of different foci (local, regional, national) and possibly through measurement of different technological readiness indices, which could further ascertain the framework's practical usefulness. We also posit that an experimental, quantitative analysis could also be useful to identify and quantify possible correlation patterns among the different antecedents, drivers and outcomes, which may in turn inform the practical configuration of the responsiveness element in governance.

Declarations

The authors have no conflicts of interest to declare that are relevant to the content of this article.

Data Availability

We did not generate any datasets, because our work follows a systematic literature review. All reviewed and analysed articles are included in the reference list.

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