In search of the enabling factors for public services resilience: A multidisciplinary and configurational approach

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ABSTRACT

This paper investigates public services' (PSs) resilience during turbulent times, such as COVID-19, to contribute to relevant academic calls that aim at identifying which combination of factors might lead PSs to develop resilient approaches during crises, despite them suffering from intrinsic management and organizational flaws. Therefore, we adopt fuzzy set Qualitative Comparative Analysis on 19 resilient Italian PSs and we test for possible effective configurations of enabling factors emerging from a literature review of: Crisis Management, Resource-Based View, Organizational Theory, Stakeholder Theory, Digital Innovation Management, which typically the main PSs' flaws are intercepted in. Our results show that the three configurations of enabling factors for resilience stem from human-based and continuous learning processes to be addressed through knowledge-based adaptive approaches. In this way, our research proves its usefulness by providing a set of insights to PSs' practitioners on the need to invest in collaborative learning processes that, by combining specific enabling factors, might innovatively mitigate the typical PSs' managerial and organizational flaws during crises.

Introduction

In 2020, the COVID-19 pandemic contingencies severely challenged the activities of public services (PSs) and their capacity to formulate adequate responses to urgent claims in a way that could address the shock caused by the sudden turbulent event (Ansell et al., 2020; Mazzuccato & Kattel, 2020). Indeed, the literature widely acknowledges that the capacity of PSs to react quickly and effectively to problems in an unstable context is typically hindered by intrinsic major flaws in PSs' management and organizational approaches and practices (Head, 2008; Masou, 2017; Peters, 2017). These are mainly related to the lack of or poor management of resources within a stiff bureaucracy (Haveri, 2006; Trinchero et al., 2020); a limited cooperative posture (Allers & De Greef, 2018; Schaeffer & Loveridge, 2002); and a lower risk tolerance (Vickers et al., 2001), all of which might prevent PSs from coping with innovation and digitalization activities (Dunleavy et al., 2006), building partnerships for creative service design (Crowley & Hodson, 2014; Osborne et al., 2013), and carrying out the effective planning of activities (Boin & Lodge, 2016).

On the one hand, because an unexpected global crisis such as COVID-19 should exaggerate some of these flaws (Ansell et al., 2020),

evidence of effective reactions from PSs was predictable in almost all countries hit by the pandemic.

On the other hand, scholars agree that, in some cases, paradoxically, adverse and turbulent events offer the possibility to tackle new challenges and nurture innovation (Al-Omoush et al., 2022) through an adapting and evolutionary ability that can be defined as resilience (Barber & Murdock, 2017; Caffrey et al., 2018; Dahlberg, 2015; Meek & Marshall, 2018; Nicholls & Murdock 2011; Vickers et al., 2001). Indeed, exceptional cases of resilience during the pandemic were detected worldwide in 2020, outlining PSs' capacity to innovatively react to a surprising event in a complex scenario (i.e., during the first wave of COVID-19) and to cope with an enduring crisis (i.e., the following waves of the pandemic).

However, a gap in the literature is which combination of factors could have contributed to developing such a resilient approach during the COVID-19 crisis, despite PSs' suffering from intrinsic management and organizational flaws (Ansell et al., 2020; Mazzuccato & Kattel, 2020; Murdock et al., 2020). Therefore, our research aims at addressing this gap by investigating the combination of such factors that allowed PSs to mitigate their flaws and create resilient and innovative strategic solutions.

Based on the theoretical frameworks, which the main PSs' flaws are rooted in, such as crisis management theory (Boin & Lodge, 2016); resource-based view (Barney, 2001; Pee & Kankanhalli, 2016);

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organizational theory (Christensen et al., 2020); stakeholder theory (Civera & Freeman, 2019; McGahan, 2021); and digital innovation theory (Andersson et al., 2018), we question what configurations and interactions of factors—that we identified within these theories as initial variables—are enablers for the outcome of increased PSs resilience.

To this end, we have adopted a configurational methodological approach: fuzzy set qualitative comparative analysis (fsQCA; Drass & Ragin, 1992; Ragin, 2009; Woodside, 2010) for two main reasons. First, our work aligns with previous research positing that innovative solutions to complex problems require a configurational method, which is, by definition, multidisciplinary and interactive (Mitleton-Kelly, 2003; Scott et al., 2017). Second, going beyond mere cause-and-effect statistical analyses, the fsQCA method allows for detecting combinations of constantly interacting variables that involve learning processes (Woodside, 2012), which are strongly required by PSs to forge knowledge-driven mechanisms into innovative service design and delivery (Dunleavy et al., 2006; Osborne et al., 2013).

To perform the fsQCA analysis, we have collected information and data from 19 Italian case studies of PSs located in three regions: Piedmont, Veneto, and Abruzzo, which successfully delivered on their mission and coevolved with their local communities during the different phases of COVID-19. We focus on Italy as the most severely hit European country and the first to enact lockdown measures, which required responses from PSs when it came to facing social and economic issues (Bonaccorsi et al., 2020; ECDC Europe, 2021; Marazziti et al., 2020).

Our investigation shows its theoretical usefulness in responding to relevant academic calls aiming to identify how and which resilient actions can be crafted by PSs during crises (Ansell et al., 2020; Murdock et al., 2020; Osborne et al., 2013). Furthermore, from a practical standpoint, we provide a set of insights for PSs' practitioners regarding the need to invest in collaborative learning processes that might mitigate the typical stiff managerial and organizational flaws to detect and combine the enabling factors that shape resilient responses during crises.

The present paper is structured as follows: The literature review section is based on the five main theoretical frameworks for identifying enabling factors. In the research method section, we describe the fsQCA, the sample and data collection process, the variables used for the fuzzy set QCA, the fuzzy set calibration, and the data analysis. Then, we report the results of the fsQCA. Finally, we present concluding remarks and identify several avenues for further research.

Literature review

Crisis management

The literature on crisis management identifies two main elements that can be applied to PSs as a way to provide a resilient response to a turbulent event (Christensen et al., 2016; Zhao, 2020). The first concerns the ability to plan (Boin et al., 2005), such as the development of a precrisis strategic plan (Boin & Lodge, 2016) by predicting the resources required to face a potential crisis and training and preparing people to act and react during turbulent times (Lodge & Wegrich, 2014). The second element is the capacity of management to transparently and clearly communicate the complexity brought about by a crisis event, both internally and externally (Comfort, 2007; Osborne et al., 2013; Trinchero et al., 2020); this can be done by sharing the plan's contents and objectives and creating a participatory environment (Osborne et al., 2013; Trinchero et al., 2020).

Scholars in the field have posited that the ability to plan effective and transparent communication contributes to increasing organizational awareness of contextual conditions (Lodge & Wegrich, 2014; Oomes, 2004).

Therefore, to examine the relationship between the initial variable and outcome of resilience, the present study proposes that an "awareness of contextual conditions" exerts a positive effect on resilience. An "awareness of the contextual conditions" will be treated as an input or enabling factor for high levels of PSs resilience. Such input can be developed by PS organizations to different degrees, which range from an absent awareness of the contextual conditions (no ability to plan and no communication) to full awareness (effective ability to plan and effective communication).

Resource-based view

The resource-based view (Barney, 2001, 1991), especially when applied to PSs (Pee & Kankanhalli, 2016), is crucial for "identifying and building strategic capacities to produce the greatest public value for key stakeholders" (Bryson et al., 2007, p. 702). The purpose behind PSs stems from the availability of resources (tangible and intangible) and knowledge in the organization, including physical, organizational, and human resources (Barney, 1991). Indeed, scholars posit that three main elements might strengthen the availability of resources and knowledge and contribute to PSs' high levels of resilience during crises: the availability of assets, the presence of knowledge capabilities, and the development of dynamic capabilities (Ambrosini & Bowman, 2009; Kraatz & Zajac; 2001; Pee & Kankanhalli, 2016; Szymaniec-Mlicka, 2014). First, the assets (tangible and intangible resources) within organizations are valuable, rare, inimitable, non-substitutable elements (Barney, 1991) that PSs should preserve, strengthen, and link. Second, the relationship between resources and knowledge is mutual and interdependent (Antunes & Pinheiro, 2020). Having a strong knowledge capability allows PSs to deploy resources in an effective way, create distinctive competencies, and improve their timeliness and responsiveness in policy elaboration and service delivery (Pee & Kankanhalli, 2016; Willem & Buelens, 2007). Third, financial assets, IT resources, and infrastructures, as well as generic and critical knowledge capability (e.g., understanding the process of organizational bureaucracy to obtain expected and fast results is critical knowledge; Hu, 2010) should lead to basic, core, and distinctive competencies (Bryson et al., 2007) and dynamic capabilities (Ambrosini & Bowman, 2009). The latter refers to the organization's capacity for learning and "the ability to continuously adapt and reconfigure a resource and capability base" (Lockett et al., 2009, p. 24). This became a key complementary construct of RBV applied to PSs because balancing the exploitation of existing resources with the establishment of new ones is essential in producing public value in an innovative way (Eisenhardt & Martin, 2000; Kraatz & Zajac, 2001). In this regard, McGahan (2021) outlines the integration between the resource-based view and what he defines as the *new stakeholder theory (NST)*. Because PSs have an intrinsic orientation toward stakeholders' prerogatives and demands, this could emphasize the interaction between PSs and the external stakeholders when it comes to accessing and reconfiguring resources and knowledge.

Therefore, to examine the relationship between the initial variable and outcome of resilience, this study proposes that the "availability of resources and knowledge" exerts a positive effect on resilience. The "availability of resources and knowledge" will be treated as an input or enabling factor for high levels of PS resilience. This input can be developed by public service organizations to different degrees, which range from absent or low (lacking or poor assets, lacking or poor knowledge capability, lacking or poor dynamic capabilities, etc.) to full availability of resources and knowledge (fully exploited assets, well-developed critical knowledge capability, rich dynamic capabilities, etc.).

Organizational theory

The key literature on organizational theory as applied to PSs outlines that stiff bureaucracy and strong dependency of decision-making processes on central bodies—which is typical of a dominant

administrative hierarchical model per Weber—might prevent PSs' prompt and resilient responses during crises (Christensen et al., 2020). However, scholars have posited that a new public management (NPM) approach—here based on less formalisation, more efficiency, a greater market orientation, and better management techniques from the private sector (Hoggett, 2007; Pollitt & Bouckaert, 2011)—can create the conditions to favor participatory and more flexible decision-making processes (Osborne & Brown, 2005). This can be achieved by strengthening knowledge and competences from governance to increase organizational capacity as a way to acquire and share knowledge (Christensen et al., 2016). This enables more autonomous decision-making processes.

Therefore, to examine the relationship between the initial variable and outcome of resilience, the present study proposes that the "autonomy of the decision-making process" exerts a positive effect on resilience. The "autonomy of the decision-making process" will be treated as an input or enabling factor for high levels of PS resilience. This input can be developed by PSs to different degrees, which range from absent or low autonomy (i.e., happening in highly bureaucratized organizations with full dependency of decision making on central bodies) to full autonomy (i.e., corresponding to more participatory bureaucratic models and the full independence of decision making on central bodies).

Stakeholder theory

Evolutionary approaches to stakeholder theory (ST; Civera & Freeman, 2019; McGahan, 2021) emphasize that three important concepts—organizational trustworthiness, stakeholder empowerment, and stakeholder engagement—can be applied to PSs as a way to make them resilient during unexpected and complex problems with unpredictable outcomes; this is done by keeping serving their purpose of cocreating both private and public value with stakeholders innovatively and creatively through partnership creation (Al-Omoush et al., 2022; Ansell et al., 2020; Ansell & Gash, 2008; Boyne & Meier, 2009; Cabral et al., 2019; Flak & Rose, 2005; Meek & Marshall, 2018; Mouraviev & Kakabadse, 2015; Papadopoulos & Merali, 2008; Sedighi et al., 2020; Torfing, 2019; Trischler & Trischler, 2022). For this reason, the development of a cooperative strategic posture (Strand & Freeman, 2015) is key to establishing partnerships with multiple stakeholders and can be obtained and enhanced through the achievement of the three concepts. First, organizational trustworthiness is essential for public services because stakeholders must perceive that PSs are acting to meet their needs and rights legitimately, without opportunistic behavior, and through fair and transparent communication (Greenwood & van Buren III, 2010; Luoma-Aho, 2007). Second, in this sense, trust is the antecedent of stakeholder empowerment. That is, it is the process that is aimed at providing stakeholders with the right tools and knowledge to participate actively and responsibly in the value cocreation processes (Dawkins, 2014). Because power can be a huge discriminant for inclusive participation of stakeholders and can influence the nature of relationships, PSs should reduce the power asymmetries and potential mistrust (Schaeffer & Loveridge, 2002) by making stakeholders feel like active parts of the organization's value creation (Dawkins, 2014) and to gain an awareness of and influence over their decisions and outcomes. This might increase their sense of affiliation and engagement with the organization and with the project itself (Dawkins, 2014; Harrison & Wicks, 2013). Therefore, third, stakeholder engagement requires PSs to respond to the needs of stakeholders through a constant two-way dialog and interactions (Burchell & Cook, 2006), here by reacting positively to their claims and empowering those who do not have the means and/or the knowledge to be included in the joint-value creation process (Herremans et al., 2016). In this way, stakeholders will be more likely to feel committed to the organization, aligned with its values, and inclined to cooperate through joint interests (Freeman et al., 2010).

Therefore, to examine the relationship between the initial variable and the outcome of resilience, the current study proposes that "cooperative strategic posture" exerts a positive effect on resilience. The "cooperative strategic posture" will be treated as an input or enabling factor for high levels of PS resilience. This input can be developed by PSs to different degrees, ranging from absent or low cooperative strategic posture (e.g., weak trust, low engagement, low empowerment, etc.) to full cooperative strategic posture (e.g., trustful relationships, effective engagement, effective empowerment, etc.).

Digital innovation

Digital transformation grew considerably during the pandemic, supporting PSs in shaping some resiliency projects by altering the way PSs and stakeholders create value (Al-Omoush et al., 2020; Ansell et al., 2020; Pantano et al., 2020; Soto-Acosta, 2020). The literature on digital innovation regarding PSs posits that three main elements can enhance PSs' engagement in digital transformation (Andersson et al., 2018; Anthopoulos et al., 2007; Brunetti et al., 2020; Dupont et al., 2015). First, long-term multistakeholder partnerships can allow digital progress where the ground is not fertile enough (Brunetti et al., 2020; Mouraviev & Kakabadse, 2015). Previous research has shown that interactions and robust engagement between public services and stakeholders have a critical influence on digital transformation by mitigating PSs' resistance to change, tendency to risk aversion, and difficulties in accessing resources flexibly (Anthopoulos et al., 2007; Dupont et al., 2015; Trinchero et al., 2020). Second, digital contamination is a key explanatory element of digital transformation (Zott & Amit, 2017); that is, the more digital-oriented the public service is, the higher the chances of developing new capabilities for sharing, applying, and creating knowledge leading to the formation of an ecosystem (Vargo et al., 2015) of improved relationships and technologies within the service model, as well as of new partnerships that are based on empowerment and engagement (Pee & Kankanhalli, 2016; Teece & Linden, 2017; Zott & Amit, 2017). Third, the attitude toward public service innovation can be explained by the capacity of PSs to cooperate with stakeholders to stimulate the emergence of a service ecosystem, where new and existing resources are combined and cocontrolled (Andersson et al., 2018; Anthopoulos et al., 2007).

Therefore, to examine the relationship between the initial variable and the outcome of resilience, the current study proposes that the "engagement with digital transformation" exerts a positive effect on resilience. The "engagement with digital transformation" will be treated as an input or enabling factor for high levels of PS resilience. This input can be developed in PSs to different degrees, ranging from absent or low engagement with digital transformation (e.g., weak partnerships, low digital contamination, poor service innovation, etc.) to full engagement with digital transformation (e.g., strong partnerships, high digital contamination, full service innovation, etc.).

Methods

Fuzzy set QCA

To simultaneously explore combinations of multiple variables—or "characteristics" in our case—we used fuzzy set/qualitative comparative analysis (fsQCA) as the main method. The fsQCA is a distinct research paradigm (Mellewigt et al., 2018; Thomann & Maggetti, 2020) that suits our investigation in various ways (Wagemann et al., 2016). First, it focuses on a joint causal system that allows interaction effects among each characteristic within a case. Therefore, it is useful for investigating the causal complexity implied in our cases (Roig-Tierno et al., 2017; Woodside, 2012). Second, it strengthens new knowledge generation using a continuous dialog between theory and case studies while favoring learning processes that are strongly

needed in public service organizations (Wagemann et al., 2016). Third, it is ideally applicable to small- to medium-sized cases (Woodside, 2010; Woodside & Baxter, 2013) that require familiarity with exploratory studies(Odanini & Maglio, 2009; Trueb, 2013). We have chosen the configurational approach because, unlike the regression method that examines the cause-and-effect relationship between the independent and dependent variables, fsQCA entails a "configurational way of thinking and theorizing about the complexity inherent in causation among management and organisational phenomena" (Misangyi et al., 2017, p. 259). Indeed, it allows the user to simultaneously explore, based on asymmetric linkages (Ragin, 2009), all the possible interactions between a set of initial variables (in our case, "enabling factors") of the phenomena under investigation and the relevant outcome (in our case, "resilience"). Essentially, fsQCA focuses on the combined effects of causal conditions (initial variables) because it assumes causation to be complex, intertwined, and holistic. fsQCA stems from equifinality, which means that it allows the user to detect the presence of multiple paths or solutions to a given outcome through the use of multiple causal effects, depending on the pathway (Fitzgerald, 2019). It also stems from conjunctural causation, meaning that multiple causal attributes are combined into distinct configurations to explain a given outcome. To minimize common method bias, we used the list of principles for correcting the estimated values by Podsakoff et al. (2012).

Sample and data collection

Our sample consists of 19 projects focusing on maintaining and improving service provision. These projects were enacted by different PSs (such as municipalities, hospitals, universities, museums, theaters, and tourism organizations) operating in various fields (social services such as food supplying; caregiving; telecommunications and digitalization; logistics; healthcare; education and research; public engagement; culture and art; and tourism development) in the following geographical areas of Italy: Turin in Piedmont, Verona in Veneto, and L'Aquila in Abruzzo. We selected projects that appeared highly sensitive to the pandemic. Furthermore, to choose the best practices for resilient projects, we have been guided by eight public sector experts—widely recognized in their own local institutional settings and representing multiple PS fields—conducting several discussions with them over video calls during the major phases of the pandemic (April–May 2020; Sep–Oct 2020; Dec 2020–Jan 2021). These experts include the following: three university professors at the University of Turin who teach Public Communication, Innovation, and Public Administration and Law; the head of the research consortium group; three members of the Board of Directors at the University of Turin and the University of Verona; a general manager of a public hospital in Turin; and the owner of a civic digital crowdfunding platform that brings together Italian public administrations to fund projects and solutions to help organizations cope with COVID-19.

To develop the case studies, we collected data using the triangulation method (Yin, 2013) and gathered information from multiple sources of complementary evidence. These sources included the literature review, semistructured interviews with 40 main stakeholders of the PSs involved in the projects, and content analysis of the reports and documents.

First, the literature review allowed us to detect the five enabling factors that we then used as the variables of our configurational analysis, which is described in the next section. These enabling factors were as follows: awareness of the contextual conditions (ACC); availability of resources and knowledge (ARK); autonomy of decision-making process (ADMP); cooperative strategic posture (CSP); and engagement in digital transformation (EDT).

Second, the semistructured interviews were conducted through Skype or other virtual meeting platforms with pivotal members and

stakeholders of the selected cases to investigate the enacted strategies and those actions that led them to keep delivering on their mission in an innovative way during different phases of the pandemic.

Table 1 contains the description of each of the selected cases in terms of organization and project title, fields, project purpose, and interviewed people.

The interviews were based on a questionnaire with open questions that first asked the perceptions of the content of the project, the reason why the project was designed, its success, and the service design and delivery in the future. Second, the questions addressed the five enabling factors outlined by the literature. In particular, the interviewees were asked to describe in detail the capacity of PSs to detect the crisis; the presence of planning tools and communication strategies to inform the organization about the crisis (ACC); the capacity to access and use new or available searching knowledge, financial, IT, and infrastructure resources (ARK); the bureaucratic barriers and what allowed human resources to take independent decisions and actions (ADMP); the willingness to establish new partnerships with private organizations and people, including the perception of trust in potential partners and vice versa; the enacted strategies of engagement and empowerment with various stakeholders (CSP); the willingness to design innovative services promptly by making use of available technologies or by searching for digital partners, and the perceived digital contamination that the service could bring in the community (EDT).

Each researcher independently cross-interviewed each participant through a reiterative process (i.e., both researchers 1 and 2 personally interviewed a respondent on different occasions). Each participant was interviewed at least twice to monitor the projects' evolution during the different phases of the pandemic and to gather further information and evaluate the resilience of the provided service. A total of 82 interviews were conducted. All interviews were recorded, transcribed verbatim, and then kept secure in a folder on the researchers' laptops.

Eventually, we consulted the available reports of the projects, both online and printed, such as descriptive documents of the projects and the impact evaluation reports.

All data and information were gathered on multiple occasions over a time span of about one year, starting in April of 2020.

Description and evaluation of variables

We use the ACC as an initial variable to clarify crisis management theory and its concepts as applied to PSs. We use ARK as an initial variable to clarify RBV theory and its concepts as applied to PSs. As an initial variable to clarify organizational theory and its concepts as applied to PSs, we use the ADMP. As an initial variable to clarify ST and its concepts as applied to PSs, we use the CSP. As an initial variable to clarify digital innovation management theory and its concepts as applied to PSs, we use the EDT. Each enabling factor was evaluated according to a 1−5 Likert scale ranking the absence (1) to the full presence (5), development, or implementation of each factor.

For ACC, the greater the knowledge developed to face crises, which translates into a full awareness of the crisis (5 on the Likert scale), the more the organization can answer public needs through a conscious and prepared reaction. Otherwise, when preknowledge leads to a low awareness of the crisis (1 on the Likert scale), the organization will find itself frozen, without the chance to react appropriately, likely being unable to play an active part in facing the crisis.

For ARK, the greater the resources and knowledge availability (5), the better the organization can implement strategic planning. Otherwise, the fewer resources and knowledge available (1), the less the organization can maintain valuable and dynamic services.

For the ADMP, the greater the degree of freedom of the public decision-maker (5), the more the organization uses the framework linked to NPM. Otherwise, the less autonomy the public manager

Table 1
Description of the sample and the interviewees.

Organization and project title	Public service field	Project Purpose	Interviewed people
1. Turin Municipality - Digitalization and Residential care home	Social services - telecommunication, digitalization	Providing digital solutions to improve the communication between the elders in a local residential care home and their relatives, through the partnership with a multinational networking digital company for the supply of devices	Digital Innovation Council Member of Turin Municipality; General Manager of the residential care home; Sales person at the multinational networking digital company
2. Turin Municipality - Caregiving	Social services - caregiving	Offering caregiving services to disadvantaged or needy citizens through the creation of a digital platform where caregivers subscribe, are checked and booked by the citizens	Digital Innovation Council Member of Turin Municipality; Assistant 1 of the Digital Innovation Council Member of Turin Municipality
3. Turin Municipality - Logistics	Logistics and transport	Managing queues and logistics outside retailing shops to facilitate the maintenance of social distancing and keep control of the transport flow around main retailers in the city, through a digital platform and a mobile application downloadable by citizens	Digital Innovation Council Member of Turin Municipality; Manager at the Public Logistics and Transportation Department
4. Turin Municipality - City Free wi-fi	Social services - telecommunication, digitalization	Enhancing the city free wi-fi network to facilitate citizens' internet usage by improving the coverage through hotspots throughout the city	Assistant 2 of the Digital Innovation Council Member of Turin Municipality; Manager at the Digital service provider company 2
5. Turin Municipality - Food provision	Social services - food provision	Supplying food to citizens in need by building a digital network where they can share their demands related to food on a variety of aspects (from food shortage to impossibility to physically reach the retailers) with potential providers, at a neighborhood level	Digital Innovation Council Member of Turin Municipality; Manager at the partner foundation
6. Turin Municipality - Knowledge sharing	Social services - telecommunications	Constantly sharing key knowledge, facts and data about Covid among citizens through an ad-hoc digital platform in order to increase their awareness and the responsiveness to restrictive measures	Digital Innovation Council Member of Turin Municipality; Communication Manager at the partner foundation for social innovation; Professor of Accounting at the Department of Culture, Politics and Society at University of Turin
7. Public Hospital 1, Turin - Covid Hub	Healthcare	Reconverting the entire hospital to covid-19 treatments and creating a hub capable of serving the local community in the best possible way	Head of the Department of Orthopedics and Traumatology and Traumatology (OAT); Assistant of the head of OAT
8. Public Hospital 2, Turin - Departments quality maintenance	Healthcare	Treating as many covid-19 patients as possible by keeping the traumatology and orthopedics departments open and able to guarantee the same quality	Head of the Department of Orthopedics and Traumatology and Traumatology (OAT); Assistant of the head of OAT
9. University of Turin, digital platform	Public engagement	Keeping a positive impact on the surrounding area by supporting the continuation of the commercial activities of local retailers	Head of the Department of Management; marketing professor; head of the project; chief of local retailers association; digital agency founder
10. University of Turin, research consortium	Education, research continuation	Informing citizens about the results of scientific research by democratizing it through knowledge sharing of university projects and main results	Head of the research consortium group; Communication University professor; applied sciences University professor; biology university researcher
11. University of Verona, research consortium	Education, research continuation	Informing citizens about the results of scientific research by democratizing it through knowledge sharing of university projects and main results	Delegate of Public Engagement activities
12. University of Turin, distance learning	Education, distance learning	Moving online all the teaching activities of the academic year, including exams and graduation sessions	Department of Management head of teaching activity; Professor of Accounting at Department of Foreign Languages, Literature and Modern Cultures, University of Turin
13. University of Verona, distance learning	Education, distance learning	Moving online all the teaching activities of the academic year, including exams and graduation sessions	Head of quality Control Department at University of Verona; Professor of Organizational Studies at University of Verona
14. Public Museum, L'Aquila	Culture, art conservation and development	Preserving and enhancing structural conditions and art heritage buy using a civic crowdfunding platform	Museum curator, local public administration - head of financial department, civic crowdfunding platform co-founder
15. Public Museum, Turin - ticket reservation	Culture, digitalization	Overcoming the social gathering risk by implementing an online ticket reservation service	Museum manager; Tourism monitor officer
16. Theater, Turin - outdoor shows	Culture, social engagement	Fitting the cultural proposal outdoor in order to comply with the restrictive measures	Theater manager; Tourism monitor officer

Table 1 (*Continued*)

Organization and project title	Public service field	Project Purpose	Interviewed people
17. Tourism Monitor Office, Turin - survey for planning	Tourism development	Observing the local perception and awareness about the pandemic and sharing common tips and strategies to overcome the impasse, by involving various categories of stakeholders and economic players through a survey	Tourism monitor officer; Promotion and markets development Officer
18. Tourism Observatory, Turin - profiling platform	Tourism development	Structuring and implementing useful profiling tools to strengthen the tourism offer in the future by creating a digital platform for engagement	Tourism monitor officer; Promotion and markets development Officer
19. Tourism Observatory, Turin - tourism events	Tourism development	Attracting and designing long term and high impact international tourism events through partnerships building	Tourism monitor officer; Promotion and markets development Officer

gives (1), the more the public service follows the Weberian bureaucratic model and takes action based on available knowledge and resources.

For CSP, the greater the CSP of the organization (5), the more the organization is keen and able to establish continuous and long-term partnerships with public organizations and people. Otherwise, the lower the CSP (1), the lower the capacity of the organization to establish partnerships of value that can support service continuation and innovation.

For EDT, the greater the EDT (5), the higher the innovation of services and digital contamination within and outside the organization. Otherwise, the lower the EDT (1), the lower the capacity to design innovative and long-term services.

Finally, the outcome variable (RES) used a dichotomic variable (0 = no resilience to 1 = full resilience).

Fuzzy set calibration

Before running the fsQCA, a calibration process was conducted to transform the original Likert scale into a continuous value ranging from 0 to 1 (Ragin, 2009; Woodside, 2010), which included identifying breakpoints that would allow the option to assign membership to set cases (Greckhamer et al., 2007). Therefore, all enabling factors were converted into fuzzy set continuous values (Fiss, 2011) by applying the "direct calibration method" approach to coding (Ragin, 2009); this method relies on identifying specific anchors for each attribute. The anchors were chosen based on a technical (relying on percentile distribution related to the sample properties) and qualitative (relying on theoretical expertise and qualitative knowledge) assessment (Greckhamer, 2011).

Specifically, to simplify the analysis without losing model significance, our original values through the Likert scale were transformed into a final scale of five categories: 0.95 (corresponds to 5: fully present/developed/implemented), 0.75 (corresponds to 4: highly present/developed/implemented), 0.5 (corresponds to 3: the point of maximum ambiguity where we considered it equally probable to represent a low or high development of that condition), 0.25 (corresponds to 2: low presence/development/implementation), and 0.05 (corresponds to 1: not present/developed/implemented). The full explanation of the variables' degrees (from 1 to 5) and their calibration are contained in Appendix 1.

For the outcome "resilience" (RES), we employed a binary logic, here assuming that 0 means that the project failed and 1 that the project succeeded. Therefore, by adopting the same "direct calibration method" as before, all projects showed a resilience equal to 0.95 because they successfully delivered services during the pandemic by using a long-term perspective and innovative characteristics.

In Table 2, the values used to determine the membership levels (five levels) are reported.

Data analysis

First, we analyzed all collected data through ATLAS.ti software. By following the principles of thematic analysis, ATLAS.ti supported our investigation by confirming the enabling factors, highlighting the emergence and frequency of keywords that can identify the enabling factors in all degrees of implementation for each considered project. We conducted axial coding (Eisenhardt, 1989; Strauss & Corbin, 1998) and double-checked the keywords that emerged from our theoretical understanding of enabling factors. These keywords emerged from the description of PSs' postures, strategies, actions, and perceptions of the interviewed persons and the lexicon adopted in formal communication within the reports and documents. We ranked the degree of implementation or development of each enabling factor based on a commonly previously agreed-upon keyword building system for qualitative evaluation, which corresponds to the literature background. This phase ended with a final agreement on the results of the evaluations of each enabling factor for each project (see Appendix 2 for the data set already fuzzy calibrated).

One example of keyword building and coding occurred when the respondents described their services when facing the crisis as follows: "Despite we need innovative and shared digital technologies [...] we can never manage to adopt digital systems that are synchronized as each of our departments acts on its own when it comes to digital implementation [...]." We coded this response as "weak

Table 2
Membership values.

Variables	Original Scaling	Calibration Rules	Fuzzy Set Values
ACC	Likert scale 1−5	$ACC \leq .2$	0 - (fully nonresponsive)
		$ACC \geq 4$	1 - (fully responsive)
		$ACC = 3$	0.5 - (cross-over point)
ARK	Likert scale 1−5	$ARK \leq .2$	0 - (fully nonresponsive)
		$ARK \geq 4$	1 - (fully responsive)
		$ARK = 3$	0.5 - (cross-over point)
ADMP	Likert scale 1−5	$ADMP \leq .2$	0 - (fully nonresponsive)
		$ADMP \geq 4$	1 - (fully responsive)
		$ADMP = 3$	0.5 - (cross-over point)
CSP	Likert scale 1−5	$CSP \leq .2$	0 - (fully nonresponsive)
		$CSP \geq 4$	1 - (fully responsive)
		$CSP = 3$	0.5 - (cross-over point)
EDT	Likert scale 1−5	$EDT \leq .2$	0 - (fully nonresponsive)
		$EDT \geq 4$	1 - (fully responsive)
		$EDT = 3$	0.5 - (cross-over point)
RES (outcome)	Dichotomic variable	$RES = 0$	0 - (fully nonresponsive)
		$RES = 1$	1 - (fully responsive)

Table 3
Necessary Conditions.

RES	Consistency	Coverage	~RES	Consistency	Coverage
ACC	0.853186	1.000000	ACC	1.000000	0.061688
~ACC	0.199446	1.000000	~ACC	1.000000	0.263889
ARK	0.722992	1.000000	ARK	1.000000	0.072797
~ARK	0.329640	1.000000	~ARK	1.000000	0.159664
ADMP	0.817174	1.000000	ADMP	1.000000	0.064407
~ADMP	0.235457	1.000000	~ADMP	1.000000	0.223529
EDT	0.678670	1.000000	EDT	1.000000	0.077551
~EDT	0.373961	1.000000	~EDT	1.000000	0.140741
CSP	0.797784	1.000000	CSP	1.000000	0.065972
~CSP	0.254848	1.000000	~CSP	1.000000	0.206522

partnerships, low digital contamination, poor service innovation" (fuzzy calibrated 0.25), hence illustrated as "low engagement with digital transformation" regarding EDT.

Second, we performed the fsQCA by employing a combination of intermediate and parsimonious (in the language of QCA) solutions (in our case, they coincided), including all counterfactuals related to the core and complementary characteristics (Greckhamer, 2011).

Results

We set a consistency threshold of 0.90 for the necessary and sufficient conditions. This ensured high model reliability and robustness, and according to the protocol of Schneider and Wagemann (2010), we conducted the analysis separately. We found no conditions individually necessary for reaching the set outcome (or the nonoutcome) —resilience (RES)—as outlined in Table 3.

As for all the other sufficient conditions, through the software fsQCA 3.0, which is based on the theoretical background of Drass and Ragin (1992)), we obtained a "truth table algorithm" to highlight configurations of those conditions that were subsets of the outcome. This evaluation was made using the measure of set-theoretic consistency reported in the consistency raw, and we selected only the potential configurations falling under consistency 1.

The final exploration consisted of a truth table analysis. Using standard analysis to derive intermediate and complex solutions (Ragin, 2009)—in our case, they coincided—we observed whether the condition of each initial characteristic contributed to the outcome when the characteristic was either present or absent. As stated, we only selected those configurations with a raw consistency greater than 0.9 (Ragin, 2009). Therefore, we obtained three equifinal (i.e., having the same outcome) configurations (or solutions) (S1, S2, S3) associated with the outcome measure (RES). Table 4 reports the

Table 4
Complex Solution.

Condition	Sufficient solutions		
	Solution 1 (S1)	Solution 2 (S2)	Solution 3 (S3)
ACC	●	●	●
ARK	●	–	●
ADMP	●	●	⊠
CSP	–	●	●
EDT	●	●	⊠
Raw coverage	0.565	0.567	0.199
Unique coverage	0.064	0.067	0.052
Consistency	1	1	1
Solution coverage		0.684	
Solution consistency		1	

● = present ⊠ = absent – = indifferent.
During the sufficient analysis the intermediate solution is equal to the complex solution.

results of these analyses using the notation system from Ragin and Fiss (2008), where each column represents the solutions linked to the RES outcome. As shown in the table, the consistency value for all solutions (S1, S2, S3) was 1, leading us to accept the consistency of all solutions (Ragin, 2009).

To better investigate the results presented in Table 4 and take advantage of the insights ensured by the fsQCA, we weighted the value of unique coverage (Ragin, 2009), which represents the coverage of a single path isolated from overlapping coverage with other paths. The solution coverage (model coverage) combination was 0.68, effectively identifying 68% of our resilient projects. As for raw coverage, the values ranged from 0.05 to 0.066, with S1 and S2 combined, here showing the highest unique coverage value (13% of our sample) of the three equifinal configurations. Table 4 also outlines that, during the sufficient analysis, the intermediate solution was equal to the complex solution. To further understand the significance of the analysis, we proceeded with a simplification of the two solutions based on Boolean algebra, as per Fiss (2011). The combination of S1 (ACC * ARK * ADMP * EDT) and S2 (ACC*ADMP*EDT*CSP) can be simplified as follows: ACC * ADMP * EDT * (ARK + CSP).

Model: RES = f(ACC, ARK, ADMP, EDT, CSP)

Algorithm: Quine−McCluskey

Solution 1 (ACC * ARK * ADMP * EDT) entailed a combination of ACC, ARK, ADMP, and EDT and covered 6.4% of our sample. In this solution, there was a simultaneous high ACC, high ARK, high ADMP, and high engagement with digital transformation. It was indifferent to whether the public service had a low or high CSP.

Solution 2 (ACC*ADMP*EDT*CSP) entailed the combination of ACC, ADMP, EDT, and CSP and covered 6.6% of our sample. In this solution, there was a simultaneous high ACC, high ADMP, high EDT, and high CSP. Here, it was indifferent to whether the public service had a low or high ARK.

With solution 3 (ACC * ARK * ~ADMP * ~EDT * CSP), which covered 5% of our sample, we found a solution where ACC, ARK, and CSP should be simultaneously high, and this was combined with the absence of ADMP and EDT.

Discussion

Our results show that three main pathways of combined enabling factors (solutions 1, 2, and 3) have led PSs in Italy to be resilient during the various phases of the pandemic and to continue to effectively serve their stakeholders in the community. In most cases, this was accomplished through innovative services with a long-term perspective.

The results indicate that these projects combined and reconfigured some of the practices, knowledge, resources, and assets that were either existent and nonused or applied in other fields rather than directly related to this specific crisis. These strategies not only mitigated what academics define as the major flaws of PSs (Boin & Lodge, 2016; Dunleavy et al., 2006; Masou, 2017; Mazzuccato & Kattel, 2020; Osborne et al., 2013; Schaeffer & Loveridge, 2002; Trinchero et al., 2020), but also contributed to shaping new approaches for coping with and reacting to crisis events (Barber & Murdock, 2017; Nicholls & Murdock 2011) and, in particular, to the pandemic (Ansell et al., 2020). It appears that adopting such approaches was possible in these cases because they had already started implementing evolutionary and learning processes (i.e., against digitalization, partnerships development, acquisition of new resources, training programs to further develop capabilities, and precrisis management) before the crisis occurred. The adoption of these approaches was an enabler to acquire a strong awareness of the contextual condition, which appeared to be the most effective characteristic for allowing public service resilience. Indeed, the characteristic ACC, unlike the others, appeared in all three solutions, leading to public service resilience.

Our first solution, covering 6.4% of our sample, focused on the conjoint constant interaction of ACC * ARK * ADMP * EDT with the outcome of resilience. This means that these enabling factors were enacted simultaneously in an evolutionary, interlinked path toward resilience. In other words, a combination of full awareness of the situation, full ARK, a free decision-making process, and full EDT can boost the success of the service.

Awareness was crucial in two ways. First, PSs demonstrating a high degree of awareness of both their complex environment (Meek & Marshall, 2018) and their purpose of creating public value through strategic capacities (Bryson et al., 2007) were able to shape an initial response:

> We realized that our solution would be effective because of our awareness of the cultural system and the way we approach it: the digital approach was, indeed, useful to maintain our mission during the crisis, because of its familiarity to users. (Museum manager, project 15)

Second, when people were well-trained on the potential strategies and actions to undertake during a crisis (Lodge & Wegrich, 2014) and attended training courses aimed at spreading knowledge on how to cope with turbulent events (Ambrosini & Bowman, 2009; Bryson et al., 2007), the increased awareness (ACC) permitted a faster ad-hoc reaction:

> The knowledge we acquired through the course about risks and actions to cope with the Ebola pandemic led us to even overreact at the beginning of the COVID-19 [...]. (Head of OAT, project 8)

Full awareness of the crisis and acknowledgement that a reaction should have been manifested promptly guaranteed that the internal resources and knowledge available were fully exploited and deployed (confirming a full ARK) (Pee & Kankanhalli, 2016):

> Luckily, we had a very knowledgeable group of workers that addressed the financial resources properly [...] this group of people was engaged in transversal activities. (Head of the research consortium group, project 10).

Furthermore, knowledge capability allowed PSs to react quickly by strengthening their core competencies for existing assets and resources (i.e., available digital platforms that were underutilized). Knowledge capability also allowed PSs to develop dynamic capabilities that permitted them to combine or reconfigure resources in an innovative way to cope with urgent new claims (Ambrosini & Bowman, 2009; Szymaniec-Mlicka, 2014):

> Despite having an initial perception of the issue of queues outside retailers all over the city, we were pressured to respond to a complete new need from the citizens and the retailers [social distancing] [...]. This was a service that we have never done before [...]. Our ability to reconvert a platform that was available before but underutilized helped to create a digital service that also improved the digital management of public transportations and logistics by our local public transport institution. (Digital Innovation Council Member of Turin Municipality, project 3)

This connects to the presence of full EDT in such a successful pathway for resilience. It appears that, when multistakeholder partnerships for digital progress were already strong (Anthopoulos et al., 2007; Dupont et al., 2015) and a certain degree of service innovation was already structured (Vargo et al., 2015), digital contamination was also fully allowed in those cases where technologies were available but underexploited. This digital contamination contributed to forming an ecosystem of improved relationships and technologies

within the service model (Pee & Kankanhalli, 2016; Zott & Amit, 2017). This was the case for the University of Turin's distance-learning project. In this project, digital contamination among the various stakeholders, such as students or departments, who were not keen to embrace digitalization before, turned out to be high during all phases of the pandemic and was expected to have innovative impacts in the new normal situation, as confirmed by the following quotes:

> The first reaction was shocking [...] despite its availability for long time, some departments did not even know that digital platforms such as Moodle existed, and they were not using it [...] we had a long road ahead of us but sharing knowledge about the benefits of adopting those technologies led to an unexpected digital contamination [...] the technological gap covered had unprecedented impacts. (Department of Management head of teaching activity, project 12)

Certainly, in such a configurational pathway, the positive role of ADMP appeared important when structuring a resilient response. It seems that, during the pandemic, the interconnections between the decision-making processes and bureaucratic-administrative structures relating to them, as discussed by Christensen et al. (2020), were made less rigid. Indeed, some projects falling under such a solution revealed that free decisions happened even in a system characterized by Weberian bureaucracy. This was because the need to react was so urgent that the people inside the organization ventured to embrace new avenues of intervention and techniques characterized by less formal and centralized control (Hoggett, 2007; Pollitt & Bouckaert, 2011). The Digital Innovation Council Member of Turin Municipality reported the following:

> At the beginning of April 2020, our white collars were so engaged in the project that they physically went to collect the infrastructures and devices from the salesperson working for our digital partner and deliver them at the residential care home for the elderly [...]. No one waited for the central body's approval. It was urgent; it needed to be done! (Project 1)

Our second solution covered 6.6% of our sample and focused on the conjoint constant interaction of ACC * ADMP * EDT * CSP with the outcome of resilience. In this solution, to reach the outcome of resilience, it was indifferent whether the ARK was high because the organization had a high CSP that, probably, permitted the detection and collection of the resources and knowledge not available inside the organization. That is why this solution, combined with solution 1 (simplified in ACC * ADMP * EDT * (ARK + CSP)), highlighted that resources and knowledge were required to reach public service resilience, no matter if they were already present or implemented in the organization or if the organization had created some cooperative strategies to detect and collect those from the outside, through partnership activation. This was underlined by the Head of the OAT in Turin (health care service):

> What was happening was so urgent that we did not have those specific competences to become a useful and comprehensive COVID-19 hub in town [...] we needed to commit to external knowledge to drive our doctors to find effective and prompt solutions [...]. In this scenario, our capacity to cooperate with external partners was surprisingly high. (Project 7)

Our third solution covered 5% of the sample and was configured with the previous ones; it contributed to covering 68% of our sample. Solution 3 showed the absence of ADMP and lack of EDT, in combination with positive ACC, ARK, and CSP. Here, a full CSP interacted positively with ACC and ARK to achieve service resilience. CSP and ARK, which in the first two solutions seemed interchangeable for the reasons explained above, combined to create the condition for ADMP

and EDT to be absent. This means that the intrinsic core purpose of public service—to cocreate both a private and public value in collaboration with other stakeholders (Cabral et al., 2019; Flak & Rose, 2005; Sedigghi et al., 2020; Trischler & Trischler, 2022)—allowed the organizations to reach resilience, even if ADMP and EDT were absent. This occurred because full CSP implies a search for valuable relationships to evolve, progressing and advancing the service ecosystem through innovative resilient solutions against digitalization or a reconfiguration of typical stakeholder roles for higher autonomy of decisions (Ansell & Gash, 2008; Ansell et al., 2020; Christensen et al., 2020; Meek & Marshall, 2008; Torfing, 2019).

Full CSP, as an expression of trustful relationships, effective engagement, and empowerment, was positively interlinked with knowledge-driven processes (as in ACC and ARK). In this last solution, we have confirmed that training, communication, knowledge capability, and dynamic capabilities are key to establishing trust, increasing the sense of affiliation, and reducing power asymmetries (Dawkins, 2014; Eisenhardt & Martin, 2000; Greenwood & van Buren III, 2010; Kraatz & Zajac, 2001; McGahan, 2021; Strand & Freeman, 2015). The following quotes confirm the above:

> *In such an urgent situation, we did not have the time to embrace the regular public service process for creating the website platform [...]. We had to find partnerships externally [...] the agency trusted us [...] because our engagement locally is already extremely high [...] that's why they partnered with us so quickly.* (Head of the Department of Management; project 9)

> *In such a short time we did not have any chance to get the financial resources from our central body [...] still the formal requests to administration departments were taking too long with too many approvals at different levels [...] Thanks to our knowledge and network, we moved differently and searched for sponsors addressing the money to a university spin-off already engaged with us and leading this specific project with us.* (Tourism monitor officer, project 19)

> *Despite our fear that most researchers (especially the oldest) could not engage with the new form of digital research consortium, we got an incredible positive reaction thanks to the efforts that the university put at the very beginning of the pandemic to empower them through intensive knowledge-sharing activities.* (Delegate of Public Engagement activities, project 11)

Conclusions, implications, and limitations of the study

In the present study, we have demonstrated that three main combinations of enabling factors, as drawn from different theoretical perspectives relevant to public services during times of crisis, could lead to PSs' resilience during turbulent times.

These findings confirm that the resilient configurational approaches necessarily stem from the adaptation of existing knowledge and resources, even knowledge and resources originally thought to serve other scopes. The results also highlight the need for leveraging continuous learning processes based on empowering the tools and knowledge that facilitate an awareness of contextual conditions (because it appears that ACC is the main characteristic for resilience with it being present in all solutions) as a basis for service

evolution and innovation, hence corroborating the arguments of Dunleavy et al. (2006) and Osborne et al. (2013). In our sample, resilient PSs proved to be fully aware of their knowledge-driven nature and, therefore, had already implemented knowledge-sharing activities to make their resources empowered, engaged, and keen to cooperate internally and externally before the crisis occurred. Such human-based and learning processes will favor knowledge sharing and flexibility and adaptation during crises, as argued by scholars (Al-Omoush et al., 2022; Ansell et al., 2020) and confirmed by the fact that PSs contain overlooked expertise that needs to be addressed through knowledge-based intervention (Boin & Lodge, 2016). We strengthened this argument by demonstrating that, even when enabling factors were missing in the configuration leading to resilience (such as ADMP and EDT in solution 3), it was human-based action as a result of continuous learning processes that led the organization to adopt new approaches and embrace innovative paths and/or more effectively leverage the resources and knowledge already present or implemented in the organization. This was accomplished by adapting previously acquired knowledge, which could balance the lack or absence of other key enabling factors.

From a theoretical standpoint, our research has responded to the relevant calls for contributions that highlight a gap about factors contributing to developing PSs' resilient approach during crises, despite them suffering from intrinsic management and organizational flaws (Ansell et al., 2020; Mazzuccato & Kattel, 2020; Murdock et al., 2020). Therefore, the present study covered such a gap by outlining the combination of the enabling factors allowing PSs to mitigate their flaws and craft resilient and innovative strategic solutions. The novelty of our work resides in adopting a configurational approach based on multidisciplinarity, which has proven effective in explaining new phenomena (Woodside, 2012) and complex problems, here according to Scott et al. (2017) and Mitleton-Kelly (2003). Indeed, overcoming the limits of a mere cause-effect logic through fsQCA, we demonstrated that even though PSs intrinsically suffer from well-recognized typical flaws discussed at the beginning of this paper, those precise configurations in response to urgent and turbulent problems can enable service resilience and innovation in the long term. Furthermore, we corroborated the theoretical assumptions that new participatory logics of crisis responses and innovative service design, including the increased use of public−private−people partnerships (Mouraviev & Kakabadse, 2015; Schaeffer & Loveridge, 2002; Sedigghi et al., 2020), are substituting for the typical transactional view of PSs in favor of a knowledge-driven process (Bridoux & Stoelhorst, 2016; Dunleavy et al., 2006; Osborne et al., 2013).

From a practical perspective, we have provided insights to PSs' practitioners on the need to invest in a coparticipatory logic with other stakeholders (such as in CSP), precrisis management actions that allow to increase the awareness of the contextual conditions once a crisis occurs (such as in ACC), and continuous learning processes through empowerment and engagement actions (such as in ARK).

The configurations of enabling factors emerging from our analysis can be generalizable to PSs in other geographical contexts. However, this eventually opens avenues for further testing by adapting the analysis to the unique characteristics of other investigated contexts. Furthermore, future research could be developed on whether and if those configurations of enablers will still be valid in a *new normal* situation.

Appendix 1. Initial values and fuzzy set calibration

Original Likert values	Calibration	ACC	ARK	ADMP	CSP
EDT					
1	0,05	No ability to plan and no communication	Lack of assets, lack of knowledge capabilities, lack of dynamic capabilities	Strong bureaucracy and full dependency of decision making on central bodies	Absence of trust, no engagement, no empowerment	Absence of partnerships, no digital contamination, no service innovation
2	0,25	Poor ability to plan and poor communication	Poor assets, poor knowledge capabilities and poor dynamic capabilities	Strong bureaucracy and low dependency of decision making on central bodies	Low trust, low engagement, low empowerment	Weak partnerships, low digital contamination, poor service innovation
3	0,5	Early implementation of planning tools and initial communication	Not fully exploited assets, generic knowledge capability, poor dynamic capabilities	More flexible bureaucracy but dependency of decisions	Initial trust, initial engagement, initial empowerment actions	Infancy of partnerships, medium digital contamination, low innovation of services
4	0,75	Good ability to plan and well-developed communication	Presence of assets, well-developed generic knowledge capability, well-developed dynamic capabilities	Autonomy in strategic planning but bureaucratic limits for actions and partial access to financial resources	Presence of trust and engagement and empowerment actions	Strong partnerships, initial digital contamination, initial innovation of services
5	0,95	High ability to plan and effective communication	Fully exploited assets, well developed critical knowledge capability, rich dynamic capabilities	Full decision making via participatory bureaucracy	Trustful relationships, effective engagement, effective empowerment	Strong partnerships, high digital contamination, full services innovation

Appendix 2. Data set

N	ACC	AR&K	ADMP	EDT	CSP	RES
1	0,95	0,5	0,95	0,75	0,95	0,95
2	0,95	0,5	0,75	0,5	0,95	0,95
3	0,5	0,5	0,95	0,5	0,95	0,95
4	0,5	0,75	0,75	0,5	0,75	0,95
5	0,5	0,75	0,95	0,5	0,95	0,95
6	0,95	0,75	0,95	0,75	0,75	0,95
7	0,95	0,5	0,95	0,75	0,95	0,95
8	0,5	0,75	0,5	0,5	0,75	0,95
9	0,95	0,75	0,95	0,95	0,95	0,95
10	0,95	0,75	0,75	0,95	0,5	0,95
11	0,75	0,75	0,75	0,5	0,75	0,95
12	0,5	0,75	0,95	0,5	0,75	0,95
13	0,95	0,95	0,95	0,95	0,95	0,95
14	0,95	0,95	0,05	0,25	0,95	0,95
15	0,95	0,95	0,95	0,95	0,05	0,95
16	0,95	0,95	0,5	0,5	0,5	0,95
17	0,95	0,25	0,95	0,95	0,75	0,95
18	0,95	0,5	0,95	0,5	0,75	0,95
19	0,75	0,5	0,25	0,5	0,5	0,95

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