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COLLECTIVELY AMBIDEXTROUS DIGITAL SERVICE ECOSYSTEMS: A CASE OF BUREAUCRACY OF DEATH

Research Paper

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Abstract

Public services often extend beyond the public sector, requiring collaboration and interaction between public and private actors. Initiating digital service innovations in collaboration is challenging, especially in large-scale public service ecosystems. While individual service providers may have clashing interests, balancing incremental improvements and radical changes (i.e., pursuing ambidextrous development) requires collective efforts. We report a case of a digital service ecosystem related to the bureaucracy of a person's death in Finland. We focused on the pursuit of collective ambidexterity, which requires collaborative development among various actors. The suggested contributions are summarized as four propositions to facilitate collective ambidexterity in service ecosystems: 1) adoption of multiple collaboration modes pursuing both efficiency gains and innovation outcomes, 2) parallel foci of top-down and bottom-up ambidextrous balancing, 3) governance of collaboration and (dis)benefits management both intra- and inter-organizationally, and 4) focus on citizen life-events to facilitate development across organizational silos and innovation beyond sub-optimization.

Keywords: digital public service innovation, public service ecosystem, collective ambidexterity, modes of collaboration, service systems, digital services.

1 Introduction

Public services often interact in complex networks and ecosystems (Brozović and Tregua, 2022). Disruptions of services and failures to meet citizens' needs can cause drastic consequences for affected individuals (Van de Walle, 2016). A recent example in Finland addresses the complexity and disruption of services provided by multiple governmental and private sector organizations in a case of death (Pohjala, 2021). The rigid bureaucracy and multiple service failures of the public-private service network required contacting different service providers repeatedly, which caused excess stress on the grieving family members. Life-event-focused digital services have been suggested (Vintar *et al.*, 2002; Haraldsen *et al.*, 2004), but limited progress has been observed (e.g., Schuppan and Köhl, 2017). Thus, the development from fragmented public services toward human centricity and digital service interoperability is a challenging and complex effort calling for digital service innovations and collaboration from multiple service providers (Eriksson *et al.*, 2021; Häikiö and Koivumäki, 2016; Hietala, 2022; OECD, 2017). Hence, digital innovations often necessitate shared resources of multiple actors to solve a common set of problems (Wang, 2021).

While digital technologies enable innovations across networks and services blurring industry boundaries (Yoo *et al.*, 2010), various actors can introduce nearly unlimited creativity to be exploited collectively (Wang, 2021). The ecosystem view effectively explains the “systems of service systems” (Vargo and Akaka, 2012). Instead of focusing on isolated actions of individual organizations and actors, service design and development needs to consider the complexity and interactions in the service networks (Rodrigues *et al.*, 2021; Vink *et al.*, 2021) at the ecosystem level. This approach assists the public sector in addressing issues that cut through various governmental and territorial boundaries, calling for multiple actors to collaborate (OECD, 2017). While service ecosystems comprise a vast network of related services provided by numerous public and private organizations, the disruptions of the services may spread across the service network (Rodrigues *et al.*, 2021). Thus, disruptions are not merely a problem faced by the citizenry; they extend throughout the network of service providers. The phenomenon represents resource consumption self-generated by the service system (Morris and Walley, 2022).

Sustainability, that is, long-term system survival and prosperity (March, 1991) in ecosystems, relies on the dual functions of efficiency and generativity (Boyer, 2020). While stability is achieved through efficiency (exploitation), innovations (exploration) are needed to facilitate generativity and resilience in the long run (Boyer, 2020; March, 1991), calling for ambidexterity, which refers to the balance of innovation and efficiency (March, 1991). While organizational balancing involves the continuous adaptation of efficiency and innovation allocations (Luger *et al.*, 2018), success at the ecosystem level calls for joint efforts toward collective ambidexterity (Inoue, 2021; Page *et al.*, 2021). Yet, due to the uncertainty of innovation, the focus often persists on efficiency (March, 1991). To address different social needs and cost-effective pressure and ensure the equal provision of public services, innovations are vital for public service delivery (Bertot *et al.*, 2016; Nowacki and Monk, 2020).

Although governments worldwide recognize the importance of public sector innovativeness and aim to legitimize it (OECD, 2019a), the demand for stable operation and risk aversiveness often favors the status quo in public sector organizations (Magnusson *et al.*, 2020; OECD, 2019b). While many studies have discussed ambidexterity in the public sector context (e.g., Magnusson *et al.*, 2020; Nowacki & Monk, 2020) and in inter-organizational settings (e.g., Kauppila, 2010; Stettner and Lavie, 2014; Bresciani, Ferraris and Del Giudice, 2018), the focus largely remains on the focal organization. The literature recently identified the significance of collective success in pursuing ambidexterity (Inoue, 2021; Page *et al.*, 2021). However, more insight is needed into the aspects and principles influencing radical innovation and efficiency in different ecosystems in the pursuit of collective ambidexterity (Inoue, 2021; Page *et al.*, 2021), which, in turn, necessitates collaboration (Hietala *et al.*, 2021; Juell-Skielse *et al.*, 2017). Against this backdrop, we set out to study public service innovation, which is “the development and implementation of a novel idea by a public service organization to create or improve public value within an ecosystem” (Chen *et al.*, 2020) and in particular, digital innovation, which adds value through the integration of digital technology (Hund *et al.*, 2021).

How can digital public service innovations be realized in a large-scale public service ecosystem in the pursuit of collective ambidexterity?

We report a single case study of a large-scale public service ecosystem in Finland. Our study extends the understanding of the novel concept of collective ambidexterity in the context of public service ecosystems by focusing on the innovation aspect of ambidexterity. Hence, our study answers Inoue's (2021) and Page *et al.* (2021) calls. We theorize how ecosystem-level innovations, largely realized through organization-level efficiency-focused development, introduce additional complexity to the governance of the whole. Hence, parallel top-down and bottom-up foci via a combination of collaboration modes are needed to achieve collective ambidexterity and the sustainable reconfiguration of service systems. Our study provides practical implications for service providers and policymakers to understand how co-initiated public service innovations designed around citizens' life events can ensure effective and equal digital public services and sustainable public service ecosystems.

2 Theoretical Foundations and Related Work

Public service organizations provide digital services of value for citizens and other stakeholders (Bertot *et al.*, 2016). This value demand is why these services exist (Seddon and Brand, 2008). However, if organizations fail to deliver services effectively, it can create excess demand, i.e., unnecessary strain on the services (Morris and Walley, 2022). Service failures can be caused by: ignorance, wherein a service provider fails to recognize the failure; rigidity, wherein bureaucratic rigidity prevents the service provider from performing effectively; or association, wherein negative conceptions influence the perceived value (Van de Walle, 2016). Moreover, service failures of one actor may result in failure demand elsewhere, which strains service providers and citizens (Seddon and Brand, 2008; Verleye *et al.*, 2017). Addressing these disruptions, which can spread throughout the network of services, is needed to ensure effective value creation (Rodrigues *et al.*, 2021). However, failure demand is created by the service system itself and can only be eliminated by changing the system (Seddon and Brand, 2008). The OECD (2017) outlined that changing complex and well-established systems requires novel approaches to address problems along with bold decision-making. Thus, service innovations could enable incremental improvements and radical changes to service systems and reconfigure the service system resources, such as people, technology, and business processes (Stoshikj *et al.*, 2016).

Although innovations are necessary for a radical transformation of service systems, long-term prosperity similarly requires efficiency of the existing capabilities and technologies, specifically organizational ambidexterity (Luger *et al.*, 2018; March, 1991; O'Reilly III and Tushman, 2008). Ambidexterity refers to the ability of an organization to explore and exploit simultaneously—that is, to improve the existing capabilities and technologies efficiently and incrementally while simultaneously exploring new innovative opportunities (O'Reilly and Tushman, 1996; O'Reilly III and Tushman, 2013). Although some studies argue that private organizations are more ambidextrous than their public counterparts (Priyanka *et al.*, 2022), ambidexterity is found to be similarly necessary for public sector organizations for enhancing service performance (Gieske *et al.*, 2020) and ensuring future relevance and legitimacy (Magnusson *et al.*, 2020). However, the risks and costs of innovativeness often hinder the efforts in the public sector (Gieske *et al.*, 2020; Hietala *et al.*, 2021; Magnusson *et al.*, 2020). Accordingly, for the ambidextrous public sector, it is necessary to develop innovation capabilities (Palm and Lilja, 2017).

Digital service innovations are not merely ICT-related, although the fast growth and general acceptance of ICT are often vital to them (Barrett *et al.*, 2015). Nor do they equal IT innovation (Baiyere *et al.*, 2023). Service innovation in a broader context comprises a service ecosystem that provides an organizing structure to exchange services, a service platform that enables efficient and effective service exchange, and value co-creation, encompassing resource integration that strives for joint value in the service ecosystem (Lusch and Nambisan, 2015). These generative digital platforms (Lyytinen *et al.*, 2017) further enable novel embeddings and affordances to create combinatory value (Baiyere *et al.*, 2023). Hence, digital innovations are open-ended by nature (Baiyere *et al.*, 2023; Bertot *et al.*, 2016; Henfridsson *et al.*, 2018). In turn, a framework for digital public service innovations defines transparency, participation, anticipation, personalization, co-creation, context awareness, and context smartness as innovation characteristics of digital public service provision (Bertot *et al.*, 2016). To be regarded as a digital public service innovation, government organizations must be able to proactively interact with service recipients and engage in cross-agency and non-government service provider collaboration to co-produce digital public services on multiple technology platforms (Bertot *et al.*, 2016). Thus, digital public service innovations reach beyond the public sector (Desmarchelier *et al.*, 2020), necessitating collaboration among public and private actors (Hietala *et al.*, 2021).

Since public service organizations do not operate in isolation but interact in various ecosystems, a public service ecosystem incorporating citizens, technology, and public and private organizations (Petrescu, 2019), can provide an effective framework for understanding public service delivery (Kinder *et al.*, 2022). A service ecosystem is a “self-contained, self-adjusting system of resource-integrating actors connected by shared institutional logics and mutual value creation through service exchange” (Lusch and Vargo, 2014, p. 161). This view helps explain the systems of service systems by emphasizing services as the foundation of value creation and acknowledging the complexity and dynamicity of

service delivery (Vargo and Akaka, 2012). Furthermore, the dynamicity calls for a continuous balancing of stable efficiency and generative innovations to achieve ecosystem sustainability (Boyer, 2020). The increasingly dynamic environment surrounding the public sector also increases the pressure to innovate (Magnusson *et al.*, 2020). While the environmental turbulence increases, so should the organizations' engagement in both, efficiency and innovation-focused activities, simultaneously (O'Reilly III and Tushman, 2008). In ecosystems, these elements are foundational for resilience (Boyer, 2020). Hence, adaptiveness and the continuous adjustment of innovation and efficiency allocations with a long-term focus are needed (Luger *et al.*, 2018). While value creation in public service ecosystems requires an interactive and open systemic model that relies on the resources of various organizations, citizens, and communities (Strokosch and Osborne, 2020), the long-term success of service ecosystems largely depends on the collective efforts of different actors (Inoue, 2021). To achieve this in an ecosystem, efforts from various ecosystem actors toward *collaborative* (Page *et al.*, 2021) or *collective* (Inoue, 2021) ambidexterity are necessary.

The literature identifies that *collective ambidexterity* emerges in platform ecosystems via the collective success of autonomous efforts of ecosystem actors (Inoue, 2021). However, value in service ecosystems is mutually created (Lusch and Vargo, 2014), calling for collaboration from multiple stakeholders (Petrescu, 2019). *Collaborative ambidexterity*, in turn, necessitates collaborative advantage and inter-organizational structures (Page *et al.*, 2021). While a collaboration *form* provides the necessary structures, collaboration *mode*—as defined by Juell-Skielse *et al.* (2017)—“has an inherent intention of attaining some benefits” and can also facilitate the advantage. Accordingly, a variety of collaboration modes may improve collective success in digital transformation (Hietala *et al.*, 2021). Such collaboration modes include public sector alliances, consortiums, joint acquisitions through framework contracts, jointly established limited companies, and standardization efforts (Juell-Skielse *et al.*, 2017). To synthesize the novel research streams of *collaborative* and *collective* ambidexterity, we adopt the term *collective ambidexterity* to cover also *collaborative ambidexterity*. Accordingly, we understand *collective ambidexterity* as the capability of multiple ecosystem actors to simultaneously pursue innovative and efficiency-focused activities in a coordinated manner.

While *collective ambidexterity* calls for the coordination of efforts of multiple organizations, digital innovations introduce complexity, interdependencies, and uncertainties in ecosystems, which challenges governance toward a coherent whole (Wang, 2021). The critical ecosystem actors consequently need to engage in collective sensemaking and design (Ofe and Sandberg, 2023) beyond the scope of development projects (Päivärinta *et al.*, 2019). Platform owners can use indirect influential mechanisms, such as openness (Inoue, 2021), and internal mechanisms of collaboration modes, such as strategic intent, joint commitment and incentives, and resource and conflict management, to support *collective ambidexterity* (Page *et al.*, 2021). Since digital innovations, as complex dynamic systems, represent implications beyond the traditional business fields and functions (Nambisan *et al.*, 2020), continuous governance of stakeholder interactions is necessary (Päivärinta *et al.*, 2019) for digital innovations (Selander *et al.*, 2010). This essentially requires the enactment of power to ensure stability and generative potential simultaneously (Ofe and Sandberg, 2023).

3 Research Settings and Methods

In 2019, the Digital and Population Data Services Agency (DVV) co-initiated collaboration with the Finnish Tax Administration, the financial sector, and a group of other stakeholders to address issues and mitigate bureaucracy in case of a person's death. Our case study focuses on integrated services around the life event of death and its related ecosystem—the ecosystem of the bureaucracy of death. We report a holistic single-case study (Yin, 2018). Our study serves as, in the Finnish context, a rare opportunity for research collaboration in an inter-organizational public-private setting with DVV, whose role is to coordinate the development of multi-party digital services (Päivärinta *et al.*, 2019). The focus was to study the effectiveness and benefits sought from envisioned digital public services designed around the life events of citizens. The service concept includes the following:

- Renewed digital service platform (Suomi.fi), including a digital briefcase and digital authorizations.
- Automated digital death estate inventory deed, including digital death estate shareholder register.
- Digital recording of the death and automatic data transfer to the population register, including the recording of the medical examination information and the recording of the burial permit.

Our data collection was guided by the concept of benefits management (Ward and Daniel, 2012). The aim was to identify the sought benefits and investment objectives of the envisioned collaborative digital service development as well as to capture the required changes and enablers (Peppard *et al.*, 2007). This approach aimed to capture the motivation and required changes of the development, that is, whether the anticipated focus was on innovation vs. efficiency. The qualitative data collected in the winter of 2021–22 include focus groups, workshop observations, and meetings with public and private service providers. Focus groups (Table 1) were designed to seize the perceptions of different service providers, i.e., agreements and disagreements (Nili *et al.*, 2017) regarding collaborative development and to formulate a collective view of the upcoming development initiative by working on an online collaboration platform. Meetings and workshop observations (Tables 2 and 3) were organized between Focus Group 1 and Focus Group 2. The meetings allowed deepening our understanding of organization-specific aspects such as concerns and business opportunity ideas. The workshop observations permitted us to capture interactions between the core service providers. The selected organizations represent the key service providers in the ecosystem of the bureaucracy of death.

Participants	Focus Group 1	Duration	Focus Group 2	Duration
Financial sector	25 participants from 11 organizations	2 hours	38 participants from 14 organizations	2 hours
Other organizations	31 participants from 9 organizations	2 hours		
Solicitors	2 participants from 2 organizations	2 hours		
Churches	3 participants from 2 organizations	1,5 hours		

Table 1. Summary of focus groups.

Workshop Observations		Participants	Duration
3 workshops	Tax Administration and DVV	14 participants	2-3 hours
1 workshop	Evangelical Lutheran Church of Finland and DVV	8 participants	1,5 hours

Table 2. Summary of observations.

Meeting	Participants	Duration	Meeting	Participants	Duration
Bank 1	1 participant	1 hour	Bank 2	4 participants	1 hour
Insurance company	5 participants	1 hour	Forest Center	4 participants	1 hour
National Land Survey of Finland (NLS)	3 participants	1 hour	Finnish Association of Funeral Services	1 participant	40 minutes
DVV (5 meetings)	1-4 participants	1-1,5 hours			

Table 3. Summary of meetings.

To formulate a comprehensive view of the phenomenon, data were also collected from 4 citizens with experience dealing with the death-related bureaucracy. The citizens were interviewed in semi-structured interviews ranging from 1 to 2 hours to obtain their thoughts on the current and envisioned future services. In addition, written evaluations of the potential benefits were received from 3 citizens. All interactions with the service providers and citizens were recorded and transcribed (apart from one meeting wherein no consent was obtained for recording). Data were also collected from various documents, including newspaper articles, concept descriptions of the new customer journey and envisioned future digital services, results of user tests of the new platform prototype (Suomi.fi), an estate inventory deed, e-mail correspondence, and written evaluations of the expected benefits and required changes received from 15 service providers. These multiple sources of evidence enabled data

triangulation and cross-data validity checks and ensured rich views of the described phenomenon (Patton, 2002; Yin, 2018). Overall, these data collection methods aimed to capture various stakeholders' multi-dimensional views and focus (innovation vs. efficiency) regarding the development initiative.

The governance of digital service development in public service ecosystems extends through multiple levels, namely institutional (macro), service (meso), and individual (micro) (Lusch and Vargo, 2014; Osborne *et al.*, 2021). Our holistic analysis (Yin, 2018) focused on the service level, wherein the interaction between organizations and key stakeholders creates value through learning and service innovations (Osborne *et al.*, 2021). We consider the service level of public service ecosystems to correspond with the group level of private platform ecosystems where collective ambidexterity emerges (cf. Inoue, 2021).

The iterative data analysis process followed documented steps to ensure a chain of evidence (Yin, 2018). We started with data matrices, where we organized our data into themes based on the central framework of benefits management—the Benefits Dependency Network (BDN) (Peppard *et al.*, 2007; Ward and Daniel, 2012). The themes were investment objectives, benefits, required changes, and enablers. We proceeded to structure the data in a visual format and link the required changes with the envisioned benefits supported by the BDN framework (See Figure 1 in the Results section). These data analysis steps allowed us to capture the simultaneous and complex relations and interdependences identified in the data (Miles and Huberman, 1994). Thus, the BDN enabled us to map the dependencies between required changes and enablers, as well as the intended benefits and objectives of the envisioned service development, that is, to visualize the focus on innovation vs. efficiency the different service providers were anticipating from the collaborative development.

To ensure the analysis's accuracy, completeness, and perceived validity, analytical triangulation was used to capture the participants' views (Patton, 2002). Accordingly, the final BDN was reviewed in Focus Group 2 to ensure that it comprehensively reflects the collective view of the various stakeholders. The participants were allowed to comment on the analysis results, and adjustments were made where necessary. The envisioned digital public service concept was further structured upon the previously conceptualized digital public service innovation framework (Bertot *et al.*, 2016) to capture the multifaceted characteristics of digital service innovation (See Table 3 in the Results sections). This structuring, together with the BDN, allowed us to identify the variation of focus (innovation vs. efficiency) and formulate an overview of the complexity of digital public service innovation realization in a large-scale public service ecosystem. Our manuscript was reviewed by a DVV representative to ensure the accuracy of our analysis, interpretations, and expressed facts.

4 Results

The aim of the collaboration in the ecosystem of the bureaucracy of death was to jointly eliminate unnecessary visits and provide more accessible, citizen-centric services by increasing automation and utilizing digitalization. It was identified that citizens are required to handle many practical matters when their beloved ones die, including a variety of paperwork, authorizations, and compiling all necessary information, often in paper format. The process necessitated visiting various public and private service providers and dealing with bureaucracy during a very stressful life event.

The traditional development process, namely identifying development goals, analyzing needs, planning a course of action, and implementing, was identified as ineffective in the current complex environment calling for new approaches. The consequent ecosystem collaboration eventually united over 50 organizations to address the issues present in the current services. Comprehensive multi-channel digital services were considered essential in ensuring quality services and facilitating true value for the service providers. In this chapter, we first present the citizens' views toward the current services. Then we describe the envisioned future services, followed by the sought benefits in section 4.3 and challenges of the required changes and enablers in 4.4. We conclude the Results chapter by answering the research question and summarizing the results.

4.1 Citizen Views on Current Services

In individual cases, the proper operation of service systems can be an effortless process, as one of the interviewees reported. Accordingly, various actors in the service network helped, supported, and shared necessary information regarding the practical matters that needed to be handled. No problems occurred, although the deceased had lived a part of their life abroad. *“The whole process, from the death to the burial, served as a kind of grief process. [...] I probably wouldn't have wanted it to go any faster or more efficiently. [...] Surely, there are cases where the process is prolonged, and it makes the lives of the relatives difficult. I did not experience that.”*

In contrast, the rest of the interviewees reported a different story. They described various problems and challenges related to current services and bureaucracy. *“We encountered conflicts every step of the way. You know, it was absolutely shocking.”* Problems occurred, e.g., paying bills, terminating different services, queue times for services, long processing times, lost documents, and ambiguous situations that required unnecessary visits. *“The hardest of all was that bills kept coming. I even booked an appointment with the bank and explained the reason [...]. No response was received. After two weeks, I went there, and they were horribly tactless. They said that the estate inventory deed is not completed; therefore, the bills cannot be paid. Then, they pushed envelopes so that the bills could be put in them. No apologies, no condolences, or anything. It was terribly hard. I paid my father's bills from my own funds.”*

Centralized services producing family relationship reports were seen as dysfunctional, causing mental load and monetary losses. *“This is not a good service. I ordered a report on family affairs, and [...] it took two months to deliver that measly paper. [...] Yes, this centralization has taken the service below review. No wonder ordinary, inexperienced customers find the situation very difficult.”* Overall, the bureaucracy has been deemed a burden during a difficult life event. While some interviewees had an opportunity to buy services and pass the clarification of practical matters to the service providers, not everyone wanted to or could acquire services subject to charges. In general, the services of funeral homes gained praise along with other service providers when the services were perceived as warm and human. The shock caused by death was characterized as an overriding affliction, making it extremely difficult for those grieving to internalize matters. One of the respondents depicted feeling as if they were in a fog. Accordingly, amid grief, it takes great effort to discover the vast number of practical matters that need to be handled. *“We received that [a document from a hospital]. There was something about whom you needed to contact first. I never knew where that slip of paper got in the end.”* The various challenges increase the pain of grieving families. The current state of the services was considered inadequate. The respondents at large considered that different service systems should interact seamlessly to ensure a smooth service journey.

4.2 The Envisioned Digital Service Concept: Ecosystem-level Innovations

The envisioned future service concept aims to improve the service experience of citizens. According to DVV representatives, this goal can be reached by creating services around citizens' life events, i.e., reorganizing the service structure and processes according to the citizen viewpoint from the beginning to the end in the life situation at hand instead of sub-optimizing the services from the viewpoint of each adjacent administrative organization (cf. Vintar et al., 2002). Digital services, automation, and the efficient utilization of information were envisioned to be at the heart of future public services. To enable transparent and equal services, a renewed digital service platform (Suomi.fi) would be able to connect the service delivery and data resources of different service providers. The main qualities of this future service concept are summarized in Table 3.

When information about the death is digitally recorded and transferred to the population register (current rate is 40%) and subsequently to different service providers, it enables consequent services to be started promptly. Additionally, it facilitates the automatic termination of services such as doctor appointments or insurance payments. The platform improves transparency by indicating where the information about the death was transferred, such as banks, insurance companies, and authorities, and which services were automatically ended or initiated.

An estate inventory is a manually compiled document that contains a list of assets owned by the deceased and a list of shareholders of the estate inventory deed. Additionally, it is used as a tax declaration. In the future, a redesigned digital estate inventory deed could be created automatically after death is recorded in the population register. The deed will automatically contain all known assets of the deceased, such as savings and real estate. DVV automatically confirms the list of shareholders, making reliable data digitally transferable to a variety of service providers. The inheritance tax declaration, including all assets, is equally visible to all shareholders.

The service platform can be used as a digital briefcase for storing relevant documents and information. Shareholders can digitally authorize funeral homes, solicitors, and service providers alike to handle the practical arrangements and access the relevant data on the platform. Authorizations can be managed on the platform and granted, e.g., for banking or liquidation of estate property. The relevant information is generally accessible to all shareholders equally and transparently.

Characteristics	Examples from the envisioned service concept
Transparency	The renewed digital services platform (Suomi.fi) shows information about the process, where information about the death is transferred, what services are automatically disconnected, tax decisions, and inheritance documents. Death estate information on the platform is equally visible to all estate shareholders.
Participatory	Content can be added and updated before death, e.g., assets and last will. Shareholders can add and update content (e.g., add beneficiaries and assets before the taxation decision).
Anticipatory	Data transfers between service providers are automated, and different services are activated/disconnected automatically. Inheritance tax declarations with verified shareholders are automatically created.
Personalized	Citizens decide to which extent they use the digital service platform and what services, if any, they access via the platform. The services are accessible via multiple technology platforms. Citizens can alter their preferences (e.g., enable commercialized content).
Co-created	Numerous public and private organizations engaged in the ecosystem collaboration and were involved in the current state analysis and service concept design phase. The service design and platform prototype were revised with genuine customers.
Context-aware	The services are developed around life events. The citizens can obtain information about nearby service providers, such as funeral homes or legal service providers.
Context-smart	-

Table 3. Characteristics of service innovation (cf. Bertot et al., 2016).

In summary, the service design aims to clarify the service experience for the citizens by redesigning services rather than digitizing existing fragmented services. It aims to enhance equality regardless of residence, opening hours, or the possibility of accessing the services in person. Regardless of how many organizations are required to provide services during a particular life event, citizens will always receive effective and equal services that work seamlessly together.

4.3 Benefits

The key benefits of the envisioned service development include time savings, cost savings, and improved customer experience and satisfaction (Figure 1). Increased automation of data transfers between and shared data resources of different service providers improves data availability and quality. It speeds up the data flow between different actors, thereby reducing the number of frauds and errors and enhancing legality and data accuracy. The digital service platform (Suomi.fi) broadens possibilities for citizen benefits, especially transparency. Together with automation, it potentially reduces unnecessary contacts and visits with different service providers. The platform enables access to services from one entry point, decreasing the need for citizens to internalize and memorize details. In addition, the platform allows for time and cost savings for both death estate shareholders and service providers.

Based on the estimates of the service providers, implementing an automatic, structured inheritance tax declaration and developing a death estate shareholder register will generate extensive organizational benefits. In this context, the verification of death estate shareholders by DVV is an essential feature, allowing different service providers to access reliable, up-to-date digital data effectively. A verified death estate shareholder list, together with a digital estate inventory deed, increases the efficiency of intra- and inter-organizational processes of different service providers, enabling considerable time savings. In turn, the services appear more reliable, efficient, and timely for citizens, reducing unnecessary visits (i.e., eliminating failure demand).

While the identified benefits focused mainly on efficiency, one organization also identified prospects for novel service innovations (Figure 1). The Finnish Forest Center, a state-funded organization, recognized an opportunity for automatic real estate title registration. This, in turn, provides prospects for time savings, increased tax revenue, sustainable forestry, and improved legal security and data protection for citizens. While the underlying processes are automated, and data transfers between service providers work seamlessly, the service can be given for free, thereby enhancing benefits realization. Thus, while the realization of ecosystem-level innovation still focuses mainly on organization-specific efficiency, the work on the joint vision started to lead toward novel service innovations.

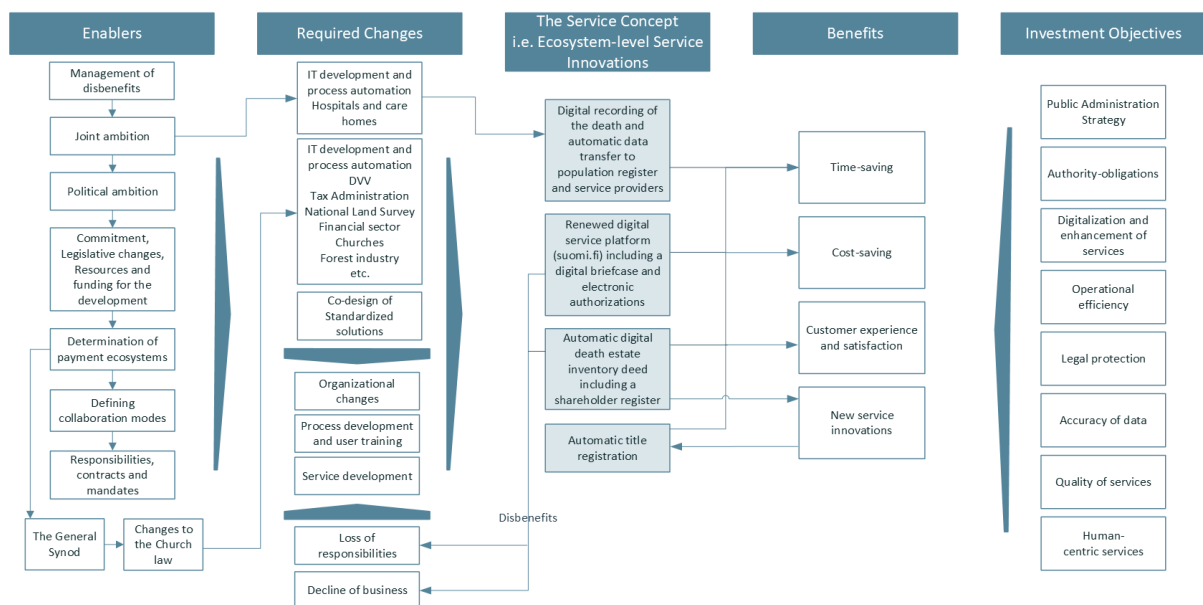


Figure 1. Partial Benefits Dependency Network (BDN).

The BDN in Figure 1 allows for identifying critical development paths that must take place to realize specific benefits, and it illustrates disbenefits that must be governed to ensure the key actors do not opt out. Hence, the BDN in the context of digital service innovations is iterative and evolves in time.

4.4 Challenges of Required Changes and Enablers

The observed conflicting interests, costs of development, and potential loss of business and responsibilities hinder the willingness to commit to extensive collaborative service development. Some service providers are conducting or have conducted intra-organizational service development, resulting in cautious attitudes toward the envisioned initiative. While this suboptimization may result in short-term benefits for an individual organization by improving internal efficiency, for citizens, this may cause decreased service quality and increased failure demand, as observed in the family relationship report.

The fear of potential loss of business when increased automation is adopted was observed to cause hesitancy toward development. For instance, the automatic digital estate inventory deed can empower citizens to complete it on their own rather than relying on experts' services. Similarly, sharing data resources and losing existing responsibilities has caused some service providers to raise concerns. “The

transfer of data is so ambiguous here. Where is the data stored? [...] We own data, we have a huge data mass. [...] Sure, from a customer perspective, we can get data to some place electronically, and it will be there for everyone to access. It can be accessed easily and quickly, and it would be well implemented and everything. [...] Do we get any compensation for that?"

Reconciling different development goals in a large-scale service ecosystem is challenging. Various reservations, such as recent investments in internal development, the details of the envisioned digital services, prioritization of various development options, and general attitudes toward the initiative, were observed to cause tensions and hamper collaboration. Hence, management of benefits, as well as disbenefits, is needed. Meanwhile, some service providers have actively observed progress outside their respective organizations. In contrast, others acknowledged that the collaboration within the ecosystem was already fruitful, potentially reducing conflicts between the varying objectives. Overall, several service providers considered it essential to implement one centralized access point for the services rather than let various competing solutions enter the market.

4.5 From the Concept toward Realization

While many service providers acknowledged a variety of benefits, the development halted at the start-up phase. The identified causes were lack of mandates as the development reaches beyond individual organizations and beyond the public sector, lack of resources and funding as the development exceeds the annual development budgets of many public organizations, lack of suitable collaboration modes able to provide the needed structures for the development, and restrictive legislation concerning the life event of death and collaborative development. To initiate the development, intra- and inter-organizational IT, process, and service development are needed. In addition, a variety of enablers were identified (Figure 1). A common view among the respondents was that governing such complexity that the envisioned initiative represents requires joint and political ambition. This motivation is needed to overcome the above-listed barriers and to obtain commitment. Further commitment is needed from the General Synod, the key decision maker concerning the Church's doctrine and ministry, and changes to the Church law. These actions further enable the regeneration of payment ecosystems and the redefinition of the responsibilities of register controllers. In the face of such complexity, support from the Finnish government was considered crucial. *"From the point of view of authorities, the goal is to get an entry into the Government program so that all different authorities could implement it according to the program and make decisions accordingly in every agency or ministry. That is what boosts this process."*

While comprehensive, ecosystem-level ambition and commitment across multiple public and private service providers are necessary to realize digital public service innovations in a large-scale platform ecosystem, the service providers identified that the development scheme needs to be divided into smaller subsets. *"Overall reform is not possible at once."* While some elements of the envisioned service development would require mere bilateral agreements and/or autonomous incremental development, a variety of collaboration modes are needed to achieve true progress and services of consistent quality. E.g., bank representatives considered the collaborative development of digital bank services beneficial, which can be coordinated by Finance Finland—the interest group of the finance sector. Similarly, co-designing other standardized solutions, such as a structured inheritance tax declaration, could be done in small compositions of key stakeholders. Thus, standardization as a collaboration mode was considered beneficial.

The development in the ecosystem aimed to improve the service experience of the citizens, but the envisioned initiative is highly complex. Hence, agreeing on the collaboration modes is critical. *"Key actors, at least the authorities, should agree on a collaboration model and responsibilities at the outset of the initiative."* Conversely, the service development at hand requires large-scale cross-governmental, private sector-dependent collaboration in which a new kind of collaboration mode—an alliance mode—was considered needed. Accordingly, our evidence revealed the emerging concept of alliance mode, which could be applied in complex digital service development initiatives where the responsibility of the development cuts across multiple public and private actors. The envisioned alliance mode could provide the mandates and means to conduct large-scale multi-partner service and software development

as well as encapsulate other necessary collaboration and acquisition modes. At the time of this research, a study on operationalizing an alliance mode was initiated.

In summary, realizing digital service innovations requires the joint ambition of numerous service providers to carry out efficiency-focused intra- and inter-organizational IT, process and service development, and benefits realization. Although various potential benefits were identified, the varying interests, goals, and values, as well as potential disbenefits, hindered the commitment. Co-development and collaboration via multiple collaboration modes are needed in this regard. Here the strategic focus must be on digital innovations while simultaneously addressing the efficiency needs of individual organizations. Critical in reforming existing service structures, removing failure demand, and realizing the benefits thereof.

5 Discussion

The studied digital public service innovations have multi-dimensional foci and loci (Chen *et al.*, 2020), becoming complex by nature (Bertot *et al.*, 2016). Hence, realizing digital public service innovations and achieving collective ambidexterity in public service ecosystems implies the following propositions:

1. Collective ambidexterity necessitates multiple strategically chosen collaboration modes to enhance both efficiency gains and innovation outcomes.
2. Collective ambidexterity requires parallel foci of top-down and bottom-up ambidextrous balancing.
3. Collective ambidexterity necessitates governance of collaboration and (dis)benefits management in intra- and inter-organizational development.
4. Collective ambidexterity can be fostered by focusing on the life events of citizens, which facilitates development across organizational silos and innovation beyond mere re-organization of the existing sub-services.

The emerging concept of collective ambidexterity has been studied in the private sector settings (Inoue, 2021) and touched upon in the public sector context (Page *et al.*, 2021). Accordingly, we next discuss our above-listed propositions and extend the understanding of collective ambidexterity in public service ecosystems and related innovations. These findings have both theoretical and practical implications.

First, autonomous suboptimization of individual organizations and services can benefit individual organizations. At the ecosystem level, however, the suboptimization may degrade service quality and create failure demand if value co-creation with interconnected service systems fails, as observed with the centralized services. Since service processes extend beyond individual service systems (Lusch and Vargo, 2014; Vargo and Akaka, 2012), a comprehensive approach to service development benefits mutual value. Unlike in private sector platform ecosystems, where collective success can be achieved via autonomous efforts of ecosystem actors (cf. Inoue, 2021), collaboration toward value co-creation is necessary in such public service ecosystems as in our case. While ambidextrous capabilities can enhance collaboration, collective ambidexterity necessitates collaborative advantages and structures (Page *et al.*, 2021), which collaboration modes can provide. Thus, collaboration via strategically chosen collaboration modes can improve the realization of a new, shared institutional logic and large-scale transformation. While bilateral agreements and/or autonomous development can increase efficiency, e.g., in automatic data transfer between service providers, and standardization could improve interoperability toward common solutions, e.g., in co-designing standardized digital death estate inventory deed, an alliance mode instituting the joint vision is needed for realizing large-scale digital service innovations and shared institutional logic. Thus, our evidence suggests that some collaboration modes can be focused on efficiency while others must facilitate innovations. While collaboration modes (cf. Juell-Skielse *et al.*, 2017) can facilitate the collaborative advantage and the structures for pursuing collective ambidexterity (cf. Page *et al.*, 2021), collaboration via multiple collaboration modes can enhance both efficiency gains and innovation outcomes. Thus, we propose multiple strategically chosen collaboration modes in a public service ecosystem to enhance efficiency gains and innovation outcomes. Second, while digital service innovations can introduce radical changes on the ecosystem level, these are often realized through efficiency-focused development efforts of individual service providers,

suggesting the need for simultaneous foci on bottom-up and top-down ambidextrous balancing. This was evident in the envisioned incremental development needed to realize the digital service innovations and the sought efficiency-focused benefits (only one service provider identified further innovation opportunities) (Figure 1). While some incremental development would be possible without ecosystem-level agreements, initiating these initiatives from the bottom-up has remained modest, such as the automatic transfer of death data. Similarly, our evidence suggested that incremental development of a mere delimited set of actors cannot produce large-scale reform and new shared institutional logic. Instead, governed collaborative development among multiple actors toward joint ambition is needed. Hence, a top-down focus is required to achieve large-scale transformation and reconfiguration of the ecosystem, as suggested by the literature (Cinar *et al.*, 2022; Vento, 2020). However, while we witnessed the emergence of new service innovation ideas by Forest Center, the envisioned development, as a whole, requires motivation toward intra-organizational IT, service, and process development from numerous service providers. This suggests the simultaneous need for slack to enable bottom-up innovations and autonomy to allow efficiency advancements necessary for the service providers. Hence, while the top-down focus ensures large-scale transformation and ecosystem reconfiguration, the bottom-up focus allows various service providers to innovate and develop internal IT, services, and processes efficiently. To achieve collective success, the two approaches are necessary for ecosystem and organizational-level benefits. Thus, we suggest that parallel top-down and bottom-up foci are needed to ensure the simultaneous balancing of innovations and efficiency toward collective ambidexterity.

Third, in line with Cinar *et al.* (2022), our results suggest that the commitment of multiple service providers is critical to ensure successful outcomes of digital public service innovations. However, while most service providers acknowledged ecosystem-level benefits for the citizens, prioritization of internal aspects was evident in the evaluations of benefits and required changes. Accordingly, the prospect of fulfilling internal objectives and benefits, which were largely efficiency focused, was the main reason for service providers to become interested in collaborative development. Moreover, while various benefits could be gained, some organizations reported mere disbenefits. It was further found that some key actors may opt out of the development if failing to address these emerging tensions. Hence, to get various stakeholders committed to realizing digital public service innovations, the intra-organizational need for efficiency must be considered simultaneously. In this context, governance within collaboration modes (Cinar *et al.*, 2022) and (dis)benefit management (Peppard *et al.*, 2007) toward a collectively ambidextrous ecosystem are necessary. Our findings indicate that the different collaboration modes provide necessary mandates and means for responsible government agencies to influence the development directions of digital public service innovations while addressing organizational efficiency needs. This top-down approach must extend throughout the multiple levels of ecosystems (institutional, service, and individual) to ensure intra- and inter-organizational development and the benefits realization thereof. In other words, different collaboration modes offer avenues to exercise power for public service ecosystem stability and generativity (Ofe and Sandberg, 2023), that is, collective ambidexterity through direct and indirect mechanisms (cf. Inoue, 2021; Page *et al.*, 2021).

Finally, while service systems interact with other service systems, reconfiguring them and removing failure demand (Seddon & Brand, 2008) calls for a holistic approach to development. However, the current services are often provided in the context of organizational silos. While DVV, as the operative project orchestrator, is liable for coordinating the development of digital services on Suomi.fi platform (Päivärinta *et al.*, 2019), lack of mandates and resources prevents progress. Thus, our study has presented a case of public services that spread over several governmental and private sector service providers, for which no one is solely responsible for the whole. Taking over the whole has required a bottom-up approach from a few service providers to initiate the digital service innovation scheme. Accordingly, our case revealed that ensuring interoperable digital services necessitates looking beyond organizational boundaries. In this context, one of the public sector representatives stated that it is the citizen that connects the services. Hence, this suggests a need to move from a business-centric to a human-centric view and consider the citizens as a whole in providing digital services (Hietala, 2022; Leikas *et al.*, 2022). Our study reported a case of co-initiation of public service innovation (Cinar *et al.*, 2022), where governmental agencies and other service providers began a collaboration aiming to address challenges

of current services from the viewpoint of a human-centric life event (cf. Vintar *et al.*, 2002). While the life-event-focused approach was first demonstrated over two decades ago (e.g., Vintar *et al.*, 2002; Haraldsen *et al.*, 2004), the challenges emerging in our case study shed more light on the development issues of the life-event-centric approach, i.e., one-stop government, which have been surprisingly challenging to reach (e.g., Schuppan and Köhl, 2017). Our case, however, suggests that, after tackling the organizational and political issues for reaching commitment on the joint service portfolio plans, the life-event focus facilitated thinking beyond organizational silos toward pursuing both innovative and efficiency-focused development and re-organizing activities simultaneously in a coordinated manner.

In addition to the theoretical implications, our findings provide practical insights that benefit service providers and policymakers alike. Our study brought forward a case of a complex public service ecosystem and demonstrated the relevance of the systems approach to address the issues of digital public service delivery and innovations. The results illustrate how public service innovations can reconfigure interconnected service systems and thus mitigate failure demand, which is critical in ensuring effective and equal human-centric digital services. In this context, it is necessary to capture the interconnected objectives and sought benefits as well as the required changes and enablers to identify suitable collaboration modes for developing service innovation and efficiency in digital services. Benefits management and BDN framework (cf. Peppard *et al.*, 2007) were found to be effective for capturing the complexity and interconnections of costs and benefits, allowing the identification of needed collaboration modes. Our findings are of value for service providers and policymakers for understanding how digital public service innovations designed around citizens' life events can facilitate effective and equal digital public services and sustainable ecosystems.

Public service innovations—by definition (Chen *et al.*, 2020)—include the development and implementation of novel ideas. Accordingly, the envisioned service development reported at this stage represents thoroughly grounded ideas as a basis for actual development rather than yet-realized innovations. To realize public service innovations and collective ambidexterity in a public service ecosystem through collaboration, top-down and bottom-up governance practices are required. As Cinar *et al.* (2022) also suggested, future research should focus on this. Despite this limitation, our study adds to the knowledge of public service innovations and collaboration toward collective ambidexterity. Future research should continue to better understand and conceptualize collective ambidexterity in large-scale, life-event-oriented ecosystems.

6 Conclusion

Public services face the demand for stability (OECD, 2019b), but radical changes and innovations may be necessary for service system reconfiguration and reduction of failure demand. While ambidexterity is needed for ecosystem sustainability (Boyer, 2020; Page *et al.*, 2021), collaboration toward human-centric service development is challenging. We brought forward a case study from a public service ecosystem—the bureaucracy of death—and described how digital public service innovations could produce incremental improvements and radical changes that enable reconfiguring service ecosystems toward improved service interoperability and failure demand reduction. Hence, we reported a rare case of a co-initiated innovation process (cf. Cinar *et al.*, 2022). We discovered while digital service innovations may produce extensive ecosystem-level benefits, realizing them requires efficiency-focused intra- and inter-organizational development from multiple service providers. Thus, realizing digital public service innovations in a large-scale service ecosystem in the pursuit of collective ambidexterity is a complex effort that requires not only the commitment and collaboration of numerous stakeholders but also parallel foci on efficiency and innovation gains with a top-down and bottom-up approach. We answered Inoue's (2021) and Page *et al.* (2021) calls. We contributed to the novel research stream of collective ambidexterity by defining it as the capability of multiple ecosystem actors to simultaneously pursue innovative and efficiency-focused activities in a coordinated manner and by describing propositions relevant to the public service ecosystem context. Our findings provide insights for service providers and policymakers regarding how digital public service innovations designed around the life events of citizens can ensure effective and equal digital services and sustainable ecosystems.

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