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Towards the Framework of Active Ownership of a Public E-Service within Transformational Government

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Abstract. The success factors and challenges of e-government projects are often examined from the perspective of observers who analyze and document the current state of affairs. In most cases, however, no clearly designated entity is identified as responsible for fostering these success factors and mitigating the challenges. To make e-government success influencers more actionable, we propose a framework of active ownership of a public e-service that specifies the responsible entities along with their skills and tasks. The underlying rationale is that a public e-service is more usable and more widely adopted if it has an accountable and engaged owner. In addition to making e-government success factors actionable, the active ownership supports e-services through a "paradigm shift" in the management of e-government engagements: instead of fragmented managerial responsibilities distributed across time-restricted projects, a public e-service receives holistic, lifecycle-long management led by one accountable entity. Moreover, mapping the tasks related to active ownership to the components of transformational government reveals that these tasks align closely with the concepts of public digital transformation.

Keywords: Digital Government, E-Government Leadership, Digital Transformation, E-Governance, Digitalization Leadership, E-Services, E-Service Management, Digital Champions.

1 Introduction

Research on the success factors and challenges of e-government projects is often carried out from an external point of view – that of the researcher who analyzes and documents the current state of affairs. The researchers themselves are not responsible for fostering the success factors and mitigating the challenges, and their research usually does not link the success factors and challenges to any responsible entity. We argue that the missing link between e-government success influencers and the responsible entity makes the success influencers less actionable, which makes it more difficult to foster the success factors and overcome the challenges.

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In order to make the e-service success influencers more actionable, this research introduces the concept of active ownership of a public e-service. By "ownership," we mean the state of being in charge of the e-service or being a motivated stakeholder. By "active" we mean being committed to the success of the e-service and acting accordingly, as opposed to merely filling the vacancy of a public administrator. The active ownership involves skills and tasks that translate into more actionable e-service success factors, predominantly those of a managerial nature.

Active ownership of a public e-service remains alongside the e-service throughout its lifecycle to counteract the fragmentation of responsibilities across governmental projects. Olsson and Berg-Johansen [1] differentiate between the owner of a governmental project, who defines the scope and goals of the project, and the project manager, who implements the project. In practice, the project owner is often a senior official who provides high-level support to the project manager and approves project funding but remains detached from the benefits of the project's outcomes. The same detachment generally applies to the project manager. Hence, we conclude that the project's outcomes may enter the service if the outcomes are picked up by the next manager; otherwise, they remain unclaimed. Projects with unused results even have labels – "shelfware projects" [2] and "orphan outputs" [3].

Our interest in active ownership of a public e-service started with an investigation of poor adoption of the German eID [4]. In 2023, only 14% of Germans were using the eID in their ID cards; the number went up to 22% in 2024 [5]. During the same time, over 99% of Swedes aged 18 to 67 had BankID [6], the de facto electronic authentication service across both public and private e-services. We argue that fragmented managerial responsibilities along the lifecycle of the eID are a significant reason for the poor adoption. Public organizations do not assume responsibility for the success of the eID, and they are not aware of anyone who does [4]: "We have no distribution. We have the best product with all the background information, but we do not have a single salesperson, neither at the federal, state, or municipal level."

The two *problems that active ownership of a public e-service addresses* are (i) the missing link between e-government success influencers and the entity responsible for acting upon them, and (ii) fragmented managerial responsibilities along the lifecycle of a public e-service. How is the active ownership supposed to tackle these problems?

The guiding *research question* of this article is: "What tasks constitute active ownership of a public e-service, which entities perform these tasks, and what skills are required of these entities?"

To answer the question, our research has developed a framework for active ownership of a public e-service outlining the necessary tasks, entities, and skills. The framework *contributes* to the research on e-government success factors and challenges by a set of managerial skills and tasks that complement the descriptive and poorly actionable e-government success influencers. Moreover, active ownership of a public e-service entails a "paradigm shift" in the management of e-government engagements: instead of fragmented managerial responsibilities distributed across time-restricted projects, a public e-service receives holistic, lifecycle-long management led by one accountable entity.

Although active ownership of a public e-service has its roots in e-government, it aligns with the goals of transformational government. Transformational government is "ICT-enabled and organization-led transformation of government operations, internal and external processes and structures to enable the realization of citizen-centric services that are cost-effective and efficient" [7]. The transformation of government operations, enabled by e-services, is the realm of active ownership that goes beyond the development and maintenance of an IT service. As we will see, the tasks related to active ownership align closely with the concepts of public digital transformation.

The article is structured as follows. The next section outlines the research method. Section 3 introduces the framework for active ownership of a public service, followed by Section 4 which motivates the elements of the framework. Section 5 demonstrates a match between the tasks related to active ownership and transformational government. Section 6 reports on the initial assessment of the framework. Section 7 concludes the article.

2 Research Method

Our previous literature review [8] explored active ownership of a public e-service in five dimensions: e-government success factors, e-government acceptance barriers, public-private partnership for e-government, stakeholders in e-government implementation, and adoption of e-services by citizens. The literature review discusses several themes – such as leadership, collaboration with external partners and suppliers, and managing interests of e-government stakeholders, Technology Acceptance Model – that shape both the success of e-services and the challenges they face.

When we considered the empirical evaluation of the concept of active ownership of a public e-service, we realized that a formalized framework was needed. At that time, we already knew the conceptual structure of the framework: there were two actors for the role of an active owner (the entities in the research question), the actors had tasks to accomplish and skills that helped them to accomplish those tasks. We needed to fill the skills and tasks with content.

To explicate individual skills and tasks, we applied deductive coding (directed content analysis [9]) to the literature review [8]. One author of this article, who was also the author of the literature review, marked the statements in the literature review that contributed to a skill or a task of either of the two actors. Then we grouped the statements into several skills and tasks. A possible ambiguity could arise between a capability to do something, which is a skill, and a need to do something, which is a task. If a statement had motivated a task, we considered it a task. We strove to avoid "capability to do" skills if "to do" was a task.

Iterative assessment of the screenings refined the groups for clearer lists of skills and tasks. The marked statements have laid the foundation for Section 4 where the motivation for the proposed skills and tasks is provided.

The framework was first presented at a workshop [10]. This article (i) updates the original literature review by covering the last few years, (ii) adds an initial assessment of the framework, and (iii) provides further analysis of the tasks related to active ownership of a public e-service.

We updated the original literature study [8] with a rapid literature review [11]. In the Scopus database, one author of this article searched for publications by the following queries (the publication years were limited to 2022–2025):

a) ("e-services" OR "e-government" OR eservices OR egovernment) W/5 (adoption OR acceptance) W/5 citizens (58 documents found)
b) stakeholders W/5 ("e-services" OR "e-government" OR eservices OR egovernment) (52 documents found)
c) (PPP OR "public-private partnership" OR "private-public partnership") AND ("e-services" OR "e-government" OR eservices OR egovernment) (25 documents found)
d) ("e-services" OR "e-government" OR eservices OR egovernment) W/5 (success OR fail* OR implement*) W/5 (factors OR barriers OR influenc* OR challeng*) (105 documents found)

If the titles of the publications seemed relevant (and most of them did), the abstract was inspected. If the abstract promised relevant findings, the publication was downloaded. For the first query, "relevant findings" meant clearly addressed e-service adoption factors by citizens. For queries (b) and (c), "relevant findings" meant clearly addressed success factors or challenges in stakeholder management or public-private partnership. For query (d), "relevant findings" meant clearly addressed managerial aspects of e-government success factors or challenges.

The downloaded publications were scanned for a research question or hypothesis that could produce the relevant findings, and the findings themselves. The selected findings were used to strengthen the existing skills and tasks associated with active ownership of a public e-service.

Finally, each skill in the framework was linked to the tasks that skill supports, in order to make sure that each skill has a purpose.

Because the framework has been recently developed, the *assessment of the framework* is limited to interviews at only one organization, Apotti, which is a Finnish healthcare IT-system provider

responsible for maintaining an integrated electronic social and healthcare records. Furthermore, Apotti maintains patient prescription information for pharmacies, a remote video consultation service, and a citizen-facing portal called Maisa, which enables citizens to access their health information via a mobile application.

Because Apotti's main business is developing and maintaining public e-services in a large and societally important domain, Apotti was considered knowledgeable enough to assess the framework. We are aware of the limitations of this assessment – a small amount of data, one well-funded domain in one rich country. Therefore, we regard this assessment as an exploratory test, a formative assessment rather than a definitive judgment of the framework's quality.

The respondents were four senior managers. Respondents A and B held strategic management positions, respondent D focused on operational management, and respondent C had combined strategic and operational responsibilities. Each respondent was interviewed separately via a video call. An audio recording of the interview was transcribed by a software tool.

An interview had a quantitative and a qualitative part. The quantitative part used a Likert scale to evaluate the relevance of each skill and task in the framework from Apotti's own point of view. The qualitative part collected feedback on the existing elements of the framework and detected gaps in the framework.

After the interviews, a thematic analysis [12] of the qualitative (non-numeric) responses was conducted using the MAXQDA software. For the Likert-scale data, we assumed the intervals between the scale points (1 through 7) as equal. Hence, we calculated the averages and identified the highest- and lowest-valued skills and tasks related to the active ownership of a public e-service.

3 Framework of Active Ownership of a Public E-Service

This section articulates the authors' conceptualization of active ownership of a public e-service, building upon prior literature.

The underpinning rationale of the active ownership assumes that a public e-service has better chances to thrive – to be more usable and more widely adopted – if the e-service has an *active owner*. Active ownership implies continuous engagement of the active owner in the success of the e-service throughout the lifecycle of the e-service, from the vision to continuous improvement.

A public e-service benefits from active ownership if it has a clearly designated active owner who is responsible for or engaged in developing, managing, and promoting the e-service. In this context, the tasks associated with the ownership are those of the owner; the ownership is something actively carried out by a small group of people or an organization. Besides performing the tasks, an active owner possesses certain skills that contribute to the successful execution of the tasks. These may include leadership and decision-making skills, along with a commitment to ensuring that the e-service meets its goals. In other words, active ownership is not just about having an assigned person or role – it requires active engagement and responsibility in practice.

The framework of active ownership of a public e-service comprises three entities (Figure 1): (i) *actors* who can be active owners, (ii) *skills*, and (iii) *tasks* of an active owner. Currently, the framework recognizes two actors: (1) the *digitalization leader within the public organization* where the e-service is being deployed, and (2) a *private organization within a public-private partnership*. These actors are the entities in the research question.

Figure 1. Entities of the framework of active ownership of a public e-service with specified actors

Public digital transformation focuses on delivering citizen-centric, cost-effective, and efficient public services [7]. Achieving this goal requires significant effort to leverage ICT to transform how public organizations operate. In this process, the actor "digitalization leader within the public organization" is the driving force. We assume that the actor is one or two people in the leadership positions and a small team of engaged co-workers. Eventually, it is up to the organization to staff its digitalization leadership. The skills (S1.i) and tasks (T1.i) of the actor are listed in Table 1.

Table 1. Skills and tasks of the actor "digitalization leader within a public organization"

Skills (S1.i)	Tasks (T1.i)
S1.1 <u>Charismatic leader</u> with strong people skills – a natural influencer who can motivate, inspire, and rally people	***Vision*** T1.1 Create the vision of digital transformation as a road towards public service delivery T1.2 Create awareness of the value that ICT adds to the public service as opposed to simply promoting ICT itself
S1.2 <u>Strategic leadership skills</u> enable long-term planning, policy development, and high-level decision-making for digital transformation	***Political support*** T1.3 Acquire political support to facilitate the e-service development and adoption; gain support from government officials and policymakers
S1.3 <u>Informal leader</u>, an internal digitalization champion without a formal title – a passionate, hands-on individual within the organization who proactively pushes for e-service adoption and modernization, even without being officially assigned the role	T1.4 Maintain contacts with e-service lobby from the society, e.g., business leaders, citizens who form constituency pressure, and politicians T1.5 Lobby simplification of laws and regulations for digitalization
S1.4 <u>Courageous icebreaker</u> who challenges norms, a forward-thinking individual who is not afraid to question outdated administrative rules, political resistance, and slow bureaucratic processes	***Support within the public organization*** T1.6 Acquire top management support for e-service development and adoption T1.7 Acquire support from civil servants who do the daily job
S1.5 <u>Leader with strong management skills within the organization</u> – a well-organized leader who can coordinate teams, budgets, and implementation processes for digitalization projects	***Changes within the public organization*** T1.8 Break established routines, resistance to change T1.9 Initiate and manage changes in the organization to facilitate the e-service development and adoption, and facilitate digital transformation
S1.6 <u>Business-IT alignment skills</u> require deep knowledge of the business processes and the operational needs at the organization on one side, and ICT and the digital enterprise architecture on the other side – the technical requirements for digitalization, the design, integration, and functionality of e-service platforms used within the organization	T1.10 Bridge departmental silos within the public organization T1.11 Recruit skilled workforce for developing e-services ***Collaborations*** T1.12 Seek and maintain collaboration with public and private stakeholders T1.13 Work to bridge organizational silos to deliver an integrated e-service capable of solving complex use cases
	Attractive public e-service T1.14 Make sure that the e-service is perceived as useful and easy to use by the citizens
	T1.15 Design the e-service from the citizen's perspective, not from the legal expert's perspective. Use concepts and processes that citizens can understand and follow, despite the laws and regulations being complex and difficult for citizens to comprehend T1.16 Market the e-service towards citizens

"Public-private partnership in the field of ICT", "innovative e-government services", and "competition on the ICT market" are three of the fifty-five Ziemba et al. [13] e-government success factors that signify collaboration between a public organization and the actor "private organization within a public-private partnership". By "private organization" we mean a supplier of the e-service's technical solution or a supplier of a privately owned software component (such as e-identification), or an equivalent vendor that stands by the side of the e-service continuously, not for a short-term consultancy assignment.

In the context of developing countries, public–private partnership is also an important financial enabler of public e-services because the private partner invests in anticipated revenue and offsets the government's poor finances [14], [15].

It is not uncommon for public organizations to outsource their operation, maintenance, and enhancement of e-services to private organizations. Although IT outsourcing is not a full public-private partnership, it is still a partnership. According to the ITIL4 IT service management framework [16], the focus of IT service delivery is on increasing stakeholders' value rather than merely maintaining hardware and software. Hence, the public and the private partners complement each other as active owners and active co-owners of the e-service.

The skills and tasks of the actor "private organization within a public-private partnership" are listed in Table 2.

Table 2. Skills and tasks of the actor "private organization within a public-private partnership"

Skills (S2.i)	Tasks (T2.i)
S2.1 A private organization is more innovation-driven and risk-taking than the public partner that operates the e-service	*Innovation* T2.1 Take the risks, create innovative IT products, and strive to outperform similar e-service solutions T2.2 Promote the e-service solution, which facilitates the adoption of the e-service *Organizational culture* T2.3 Disrupt bureaucracy and governmental inertia within the public-private partnership, help the public organization embrace changes, and eventually the digital transformation

Citizens are not considered for the role of an active owner of a public e-service. Although citizens are important stakeholders and the end-users of e-services, they are not responsible for the operation of these services.

4 Motivation behind Skills and Tasks

This section links the skills and tasks listed in Table 1 and Table 2 to the literature sources.

4.1 Skills of the Actor "Digitalization Leader within the Public Organization"

S1.1 Charismatic leader with strong people skills – a natural influencer who can motivate, inspire, and rally people. According to Ziemba et al. [13], e-government success factors "ICT leadership and visionaries in government units" and "top management support" should not be taken for granted; the first is a valuable skill, and the second is a result of that skill. Kamal et al. [17] name "project champions" as vital in effectively leading technology-integration projects. E-government success stories, for instance, in India have often been associated with charismatic leaders [18]. Neufeld et al. [19] integrate the Unified Theory of Acceptance and Use of Technology (UTAUT) with charismatic leadership theory and conclude that a charismatic project champion increases the acceptance of ICT within an organization. S1.1 apparently supports the tasks T1.3, T1.4, T1.5, T1.6, T1.7, T1.10, T1.12, T1.13, and T1.16.

S1.2 Strategic leadership skills enable long-term planning, policy development, and high-level decision-making for digital transformation. Antonopoulou et al. [20] list strategic leadership as one of the three components of digital leadership, the other two being business knowledge and ICT knowledge. The earlier-mentioned "ICT leadership and visionaries in government units" [13] implies strategic leadership. S1.2 apparently supports the tasks T1.1, T1.2, T1.3, T1.5, T1.6, and T1.13.

S1.3 Informal leader, an internal digitalization champion without a formal title – a passionate, hands-on individual within the organization who proactively pushes for e-service adoption and modernization, even without being officially assigned the role. Engaged co-workers, with the drive and appreciation for how technology transforms service delivery, make people involved [21]. S1.3 apparently supports the tasks T1.7, T1.8, and T1.14.

S1.4 Courageous icebreaker who challenges norms, a forward-thinking individual who is not afraid to question outdated administrative rules, political resistance, and slow bureaucratic processes. The public sector is more likely to succeed with digital transformation if the managers challenge the administrative norms and political agenda [22], and institutional cultural barriers [23]. S1.4 apparently supports the tasks T1.1, T1.2, T1.8, T1.13, and T1.15.

S1.5 Leader with strong management skills within the organization – a well-organized leader who can coordinate teams, budgets, and implementation processes for digitalization projects. The defined roles of Chief Information Officer do not always match the skills of the individuals in these roles. In particular, there is a lack of people's skills, as well as a lack of cross-competence between digital technology, strategic leadership, and change management [22], [23]. In the public sector, managers are not seen as leaders but rather as traditional governmental administrators who are regulated by rules and institutional norms. Managers are often recruited and promoted based on their professional merits rather than leadership skills [22]. S1.5 supports the tasks T1.8, T1.9, T1.10, T1.11, and T1.12, but is also useful in networking and lobbying tasks.

S1.6 Business-IT alignment skills require deep knowledge of the business processes and the operational needs at the organization on one side, and ICT and the digital enterprise architecture on the other side – the technical requirements for digitalization, the design, integration, and functionality of e-service platforms used within the organization [20], [22]–[24]. S1.6 apparently supports the tasks T1.1, T1.2, T1.6, T1.7, T1.9, and T1.11.

The above set of skills is in high demand on the job market; therefore, lower-paid public-sector vacancies must compete with better-paid private-sector vacancies. It is difficult to attract experts from the private sector [23]. Furthermore, the practice of recruiting and promoting public-sector managers disregarding their leadership skills and cross-competencies [22], [23] results in vacancies of active owners of public e-services not being well-staffed.

4.2 Tasks of the Actor "Digitalization Leader within the Public Organization"

T1.1 Create the vision of digital transformation as a road towards public service delivery. Important during the early stage of the digitalization engagement. If the organization does not know how to approach digital transformation, has no interest in doing digital transformation, and has no vision of where to go, then digital transformation is likely to be limited to the digitization of data [25], [26].

T1.2 Create awareness of the value that ICT adds to the public service as opposed to simply promoting ICT itself. Awareness of the return on investment may be problematic during the early stage of the digitalization engagement [23], [27].

T1.3 Acquire political support to facilitate the e-service development and adoption; gain support from government officials and policymakers. For quite some time, implementation of e-government has been focused on technical and operational matters, whereas non-technical (institutional and political) barriers are the ones largely responsible for poor e-government adoption [28]. Elected politicians may or may not set e-government as a political priority [29], [30]; politicians can make a political career on new and successful innovations [31].

If e-government is among political priorities, it will be treated as a law or regulation; if not, public organizations will rely on existing laws and regulations [32]. "The leadership provides the role of reformers who will help the e-governance initiatives sail through. The leadership may as well come from the private sector [...] it is the politics of e-governance initiatives that probably hold the key" [33].

T1.4 Maintain contacts with e-service lobby from the society, e.g., business leaders, citizens who form constituency pressure, and politicians. For instance, in the United States of America, non-governmental stakeholders – business leaders, citizens who see the success of ICT in business and develop constituency pressure, elected officials, and interest groups who speak for their constituents – may have more e-service pro-adoption influence on local governments than governmental stakeholders have [34].

T1.5 Lobby simplification of laws and regulations for digitalization. Complexity of the legal system is one reason why civil servants, for instance, in Germany prefer offline service delivery channels [4]: "The simpler and clearer the law is formulated, the easier it is to digitize it. [...] at the federal level as well as at the state and local level, the law simply has to be simplified so that it can be digitalized throughout." European Commission's "Better Regulation Guidelines" include a REFIT chapter that aims to "simplify laws, streamline procedures and eliminate unnecessary burdens without undermining the objectives and benefits of the policy in question, e.g., by means of looking for digital solutions" [35].

T1.6 Acquire top management support for e-service development and adoption. Institutional barriers are more often than technical challenges responsible for poor e-government adoption [28]; therefore, top management support is a top priority [13]. Top management ensures an integrated approach to e-government where departmental silos have to cooperate [36]: "Now we have a board of directors who actually worked together, regardless of our differences, and thus are prepared for the fact that the struggles between the silos will have to be broken down."

T1.7 Acquire support from civil servants who do the daily job. Ideally, public managers and employees are driven by professional values and ambitions that prompt them to improve the services they are responsible for [31]. Nevertheless, digital transformation requires a change in the culture of the employees [26].

Convincing stories may help change the employees' beliefs and values and facilitate the adoption of new routines with the use of ICT [37]. There are three types of stories that digitalization leadership may use to engage civil servants in digital transformation [38]. An aspirational narrative emphasizes the many opportunities that the new technology opens, embodying expectations from digital transformation. Following, a setback narrative excuses failures as an intrinsic part of digital transformation, and even sees the failures as an advantage. Finally, a persistence narrative deals with prior expectations not being met; it recalibrates the expectations and encourages patience.

Still, the stories are not enough. According to a study in South Africa, the employees need training and incentives, such as enhancement of job performance or reduced workload from using ICT [39].

T1.8 Break established routines, resistance to change. Public organizations have little competition [31] that threatens their survival, and the drive to change may be weaker than the resistance to change. "It's just hard to break out of the way, the norms and cycles that we've been doing things for so long. And quite frankly, most folks, especially when you are at a political level, aren't incentivized to do that" [23]. Government employees are not motivated to change [40]; they enjoy the security and comfort of established work routines [32]. In countries with poor e-government traditions, civil servants are likely to be pessimistic about and even frightened by digital transformation [41]. Some senior officers prefer working with legacy systems; officers close to their retirement are skeptical about digital strategies altogether [41].

Public managers and elected politicians may be risk-averse because failures may damage their careers; public services are relatively complex, multifunctional, based on laws and regulations, and difficult to change without causing problems [31].

T1.9 Initiate and manage changes in the organization to facilitate the e-service development and adoption, and facilitate digital transformation. ICT alone does not ensure digital transformation; digital transformation requires changes in the organizational structure, the roles, responsibilities, and culture of employees [26]: "You can build a fancy front office, but if the back-office lags behind, this is of no use. The back office needs to be re-organized to accomplish the front office's goals."

T1.10 *Bridge departmental silos within the public organization.* The silos can cooperate through data, information, and knowledge sharing [42]. On the managerial side, three mechanisms may help: encouraging informal coordination, better monitoring of the implementation of political directives, and remedial policy-making where the failure is addressed [43].

T1.11 Recruit a skilled workforce for developing e-services. Hiring people with appropriate skills should not be underestimated, because "it is very hard to give people […] new technical skills once they are in government" [23]. Governments tend to hire the wrong people with the wrong skill sets for work with digital tools, largely because of the failure to understand the skills needed for the job opening, and inflexibility around hiring processes and rules [23].

T1.12 Seek and maintain collaboration with public and private stakeholders. The bureaucratic nature of governmental organizations is characterized by rigidity, hierarchy, routinization, and risk aversion [44], which are safety measures for preserving accountability and democratic values [45] but are also responsible for the difficulty in embracing innovation and e-services [34]. The tasks in Table 2 demonstrates a reason why public organizations should seek collaboration with private organizations.

Acceptance of such collaboration in e-government is country-specific. For instance, in Germany, the private sector is not normally involved in developing public e-services. Instead, resource-scarce public organizations adopt solutions that other public organizations have already created [4].

While taking proper care of the e-service stakeholders should lead to success [46], [47], a governmental project may be misused by a stakeholder to secure the stakeholder's own power and political benefits instead of working for a common goal (a case in Greece) [48]. Poor coordination between stakeholders has been reported as the main cause of conflicts in Sri Lankan governmental projects [49], which highlights the importance of strong operational leadership during a public development project.

Collaboration between public organizations is motivated by the society-level tasks in Section 4.5.

T1.13 Work to bridge organizational silos to deliver an integrated e-service capable of solving complex use cases. Silos in governmental structures make e-service development more difficult. For instance, in South Africa, "we rely quite heavily on the national level strategies and so forth, but again every province has its own kind of that, and each focuses on what they perceive as important" [50].

Successful examples of breaking down the silos do exist. For instance, Finland and Estonia operate cross-border ePrescription – pharmacies in one country accept electronic drug prescriptions from the other country. The e-government project faced several challenges but benefited from the drivers such as organizational and national resources, a long-standing tradition of cross-border cooperation, trust, political commitment, and pan-European support [51].

The concept of horizontal integration across public organizations for the delivery of public e-services is not new [52], but we have not seen it among e-government success factors. We argue that public e-services will become increasingly popular when they start solving complex issues that require seamless and invisible for the citizen co-operation between public organizations.

T1.14 Make sure that the e-service is perceived as useful and easy to use by the citizens. Accessibility and inclusivity, ease of use, and perceived usefulness [53]–[55] are the key features of public e-services according to end-users. Technology Acceptance Model (TAM) [56] states that a person will use a software system, and how the person will use the system, depending on how the person perceives the usefulness of the system and the ease of use of the system. TAM is the

most widely utilized theory to explore e-government applications [57], which signals the importance of perceived usefulness and ease of use for the adoption of public e-services by citizens.

The aforementioned German eID is not popular because, among other reasons, it is difficult to understand and use. Therefore, public organizations prefer other means of authentication; hence, few public e-services require the eID. Because the eID is rarely used, citizens never learn how to use it [4].

Users of public services are more actively engaged in raising demands, providing critical feedback, and co-producing solutions than customers in the private sector are [31], which helps develop citizen-centered public e-services.

T1.15 Design the e-service from the citizen's perspective, not from the legal expert's perspective. Use concepts and processes that citizens can understand and follow, despite the laws and regulations being complex and difficult for citizens to comprehend. It is not easy to "translate our specialists' know-how that we have in the administrations, […] into the language that is close to that of the citizens" [4]. For instance, German citizens prefer personal consultation when they contact public services [29], which signals the citizens' non-understanding of the regulations.

T1.16 Market the e-service towards citizens. Many citizens are indifferent to embracing new technology and opt for the status quo approaches, and remain satisfied with the existing offline alternatives (surveys in Germany [29], Jamaica [58], Mauritius [59], and Latvia [60]). Limited communication and marketing of e-services are among the known barriers that make e-government initiatives fail [61]. Therefore, citizens also need those convincing stories [37], mentioned in T1.7, to change their beliefs and values, and to adopt new routines for accessing public services. Resistance to change has been highlighted as a major barrier for e-service adoption by the citizens in Germany [62].

4.3 Skill of the Actor "Private Organization within a Public-Private Partnership"

S2.1 Private organization is more innovation-driven and risk-taking than the public partner that operates the e-service. Public organizations are characterized by rigidity, hierarchy, routinization, and risk aversion, which impede innovation (see T1.12). Private organizations, however, must compete for the rights to be suppliers to public services, and useful innovation makes a supplier stand out among the competitors. A moderate amount of competition stimulates innovation [63], [64], whereas "excessive competition exacerbates uncertainties and uses up limited resources. It also deteriorates internal or external collaboration" [63].

4.4 Tasks of the Actor "Private Organization within a Public-Private Partnership"

The tasks below of a private organization, in partnership with a public one, are those of an *active co-owner* of a public e-service.

T2.1 Take the risks, create innovative IT products, and strive to outperform similar e-service solutions. A front-runner who delivers the best-in-class e-service solution is a sought-after active co-owner of a public e-service, if the solution is affordable. Also, see S2.1.

T2.2 Promote the e-service solution, which facilitates the adoption of the e-service. One reason for the aforementioned poor adoption of the German eID is a lack of distribution – the organization that operates the eID does not put enough effort into promoting the service among public organizations and citizens [4].

Given that the e-service has the necessary political support, the private partner can support the public one with an entrepreneurial mindset, as well as task management and task execution skills. "The leadership may as well come from the private sector, wherein the private partners may drive the whole initiative for the government" [33].

T2.3 Disrupt bureaucracy and governmental inertia within the public-private partnership, help the public organization embrace changes, and eventually the digital transformation. The

entrepreneurial mindset and management skills (see T2.2), and the "private sector thinking" disrupt governmental inertia and routine dependency [23], which eventually helps to accomplish T1.8 and T1.9.

Comparison of tele-centers ("internet cafés" with focus on public e-services) in Bangladesh and the Philippines exemplifies the advantage of "private sector thinking" in delivery of public e-services [14]. In Bangladesh, tele-centers are organized as public-private partnerships, whereas in the Philippines, tele-centers are operated by local governments. In Bangladesh, the share of tele-centers with functioning internet and equipment is higher, and the selection of offered public e-services is broader than in the Philippines. Bangladeshi tele-centers are staffed by motivated individuals with an ICT background, whereas in the Philippines, the staff typically consists of a single person from the town hall who manages the tele-center alongside other duties. In Bangladesh, the income of the operator of a tele-center is directly linked to the success of the tele-center, which facilitates the availability and usability of the tele-center.

Another example of a successful public-private partnership is BankID in Sweden [65]. BankID, owned by a consortium of banks, is the de facto electronic authentication service for both public and private e-services. In 2024, 99.9% of the adult population in Sweden had a BankID [6]. Public sector accounted for 5% of the use, signing mobile payments accounted for 18%, banking and finance accounted for 51%, and other private sectors accounted for 26% [6]. The "other private sector" shows that many companies and their customers regard the widely accepted BankID as more convenient than the traditional username-password authentication.

4.5 Citizens' Trust in E-Services

The literature repeatedly identifies citizens' trust in e-services as a key e-government success factor. Building citizens' trust in e-services is not the responsibility of a single public organization. Nevertheless, managing a public e-service in a way that addresses trust-related issues is something an active owner of the e-service should do. Transparency, openness, and trustworthiness are among the most appreciated e-government features [55], [66]. Also, a later version of TAM has added trust as one of the technology acceptance factors [67].

Trust in an e-service provider is more important than trust in the Internet as the e-service communication medium [68], [69]. Skepticism that the government gathers information about citizens through various channels, and "no one knows" how the data is being used, can discourage people from using public e-services [50]. Furthermore, trust in data and privacy protection, specifically the extent to which citizens' data is safeguarded against unauthorized access, plays a pivotal role [50].

"Trust in the specific e-government service" and "problem responsiveness" [70] are other aspects of trust: will anyone actually receive the submitted application and proceed with the case? Sri Lanka, for instance, has a strong tradition of face-to-face interaction between citizens and local governments in overcrowded receptions [71] where a citizen gets direct contact with the recipient of the case; trust in e-government may be undermined by the technology-created spatial and temporal distance between a citizen and the government [72]. Furthermore, while computer-literate citizens may prefer digital channels for getting information, solving a problem may be easier face-to-face [73], and so may be getting personal consultation [29].

More general "digital trust" is the confidence citizens place in digital systems, processes, and technologies to protect their data, ensure privacy, and maintain security. It is a recurring concern, for instance, in Pakistan [74] and, arguably, in all countries.

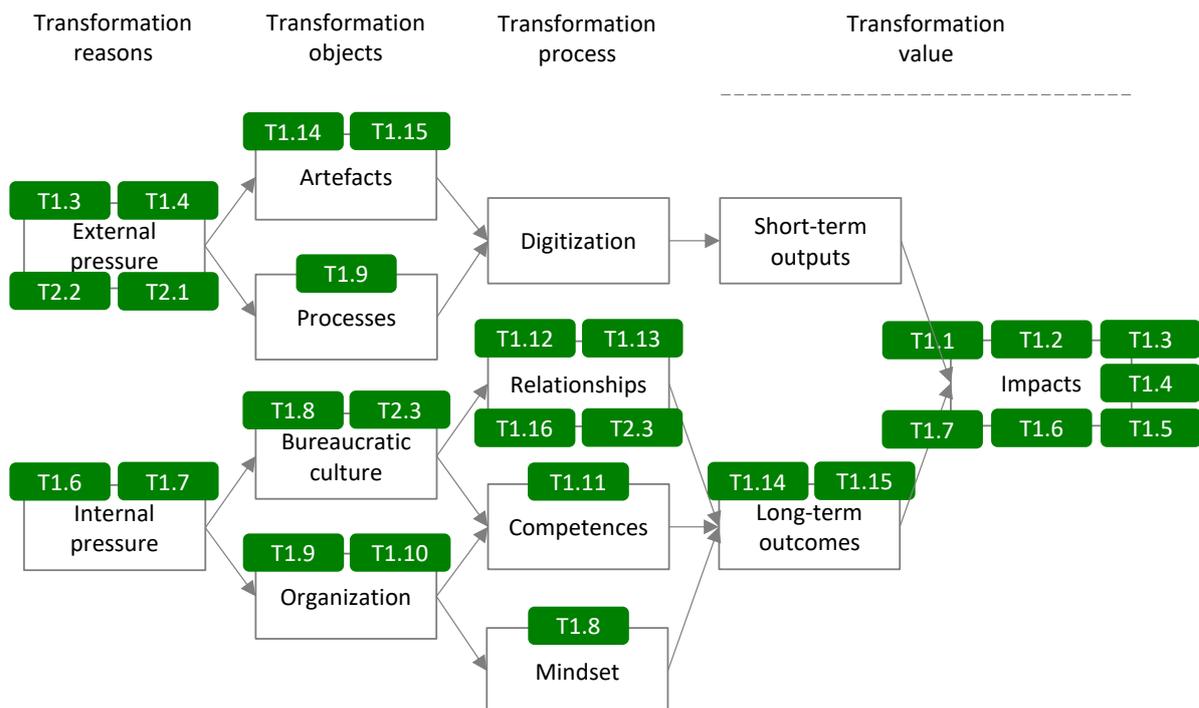# 5 Active Ownership of a Public E-Service in the Context of Transformational Government

Although Section 4 discusses the elements of the framework of active ownership of a public e-service largely in the context of e-government, the resulting tasks of an active owner are about

building relationships, managing changes in the organization, and addressing the needs of citizens. Hence, we conclude that the actual context of the framework is transformational government.

To demonstrate the validity of these conclusions, we used the transformational government pattern map developed by Mergel et al. [75]. The components of transformational government entail activities, something that happens within the scope of a component, or they are transformation objects. On the other hand, the tasks of an active owner postulate what the active owner should do. We subjectively linked these "should do" to "happens within the scope of the component" and plotted the tasks on the transformational government pattern map, see Figure 2.

The pattern map details the reasons (we would call them initiating factors), objects, processes, and value of public digital transformation. The actual reason for the transformation is the expected *impacts*. The societal value that public digital transformation is expected to create lays the foundation for (T1.1) the vision of public digital transformation, (T1.2) the awareness of the value that ICT adds to the public service, it is an argument (T1.3) to seek political support, (T1.4) to maintain contacts with e-service lobby from the society, (T1.5) to lobby simplification of laws and regulations for digitalization, to acquire support from (T1.6) top management and (T1.7) civil servants.

The expected impacts are supported by *long-term outcomes*, such as improved services and processes, as well as developed policies [75]. From the citizens' point of view, it results in (T1.14) useful and easy-to-use public e-services that (T1.15) "talk the language" of citizens rather than that of a bureaucratic organization.

Figure 2. Transformational government pattern map [75] with the tasks of an active owner of a public e-service linked to relevant components.

External and internal pressure are the initiating factors of public digital transformation. The *external pressure* comes from citizens, businesses, politicians, and technological change [75]. To maintain that pressure, an active owner of a public e-service should (T1.4) maintain contacts with business leaders, citizens, and (T1.3) politicians. The actor "private organization within a public-private partnership" (T2.1) drives and (T2.2) promotes the technological change.

The external pressure facilitates digital transformation of *artifacts*, such as public services and external and internal *processes* [75]. Tasks T1.14 and T1.15 take the public services and public processes as input, whereas task T1.9 deals with internal processes.

The *internal pressure*, which is much weaker than the external one, comes from the leadership that recognizes the need to modernize the business models and to improve the management of the organization [75], which enables (T1.6) top management support.

The internal pressure may also come from (T1.7) public servants' dissatisfaction with the current way services are delivered. Both the leadership and the public servants contribute to the change of the (T1.8, T2.3) *bureaucratic culture* and the (T1.9, T1.10) *organization*. To enable that change, the (T1.11) *competencies* of managers and public servants, and the (T1.8) *mindset* toward public service delivery need to be addressed. A change in the bureaucratic culture changes the organization's awareness of citizens' needs and subsequently changes the *relationships* with the (T1.16) citizens, and other (T1.12, T1.13) public and private stakeholders. (The paragraph so far is derived from [75]). A good relationship with the actor "private organization within a public-private partnership" helps to (T2.3) disrupt bureaucracy and governmental inertia.

Short-term outputs produced by the digitization of existing public services were of lesser importance [75]; therefore, we do not address them.

Because the tasks of an active owner of a public e-service align with the components of transformational government well, we claim that these tasks are a subset of those of public digital transformation.

6 Assessment of the Framework of Active Ownership of a Public E-Service

This section evaluates the preliminary validity and applicability of the framework of active ownership of a public e-service through a single organizational case. The findings of the assessment of the framework have three main points: (i) the quantitative assessment of the skills and tasks associated with the active ownership of a public e-service, (ii) potential partnerships related to the active ownership, and (iii) suggested gaps in the framework.

6.1 Quantitative Assessment of the Skills and Tasks Related to Active Ownership of a Public E-Service

The quantitative assessment is based on data elicited from four employees (A, B, C, and D) of Finnish healthcare IT-system provider Apotti. The details on data acquisition are available in Section 2 and the results are reflected in Table A1 and Table A2 in the Appendix, where the scores are assigned to the skills and tasks related to active ownership of a public e-service, using a scale from 1 (not important) to 7 (extremely important).Globally, across both actors, "digitalization leader within a public organization" and "private organization within a public-private partnership", the highest mean score, 6.75, was assigned to the skill S1.2 "Strategic leadership skills enable long-term planning, policy development, and high-level decision-making for digital transformation." The skill S1.5 "Leader with strong management skills within the organization – a well-organized leader who can coordinate teams, budgets, and implementation processes for digitalization projects" and the tasks T1.5 "Lobby simplification of laws and regulations for digitalization", T1.6, "Acquire top management support for e-service development and adoption" and T1.10 "Bridge departmental silos within the public organization" follow with a mean score of 6.5 each.

The top-ranking skills and tasks have a mix of strategic (S1.2 "Create awareness of the value that ICT adds to the public service as opposed to simply promoting ICT itself", T1.5, T1.6) and operational (S1.5, T1.10) focus.

The *lowest scores* have been assigned to the actor "private organization within a public-private partnership" (see Table A2). A possible reason for the low scores is the fact that Apotti does not quite see itself in that role. Since "Oy Apotti Ab" is a limited liability company that invoices the public healthcare system for the provided services. On the other hand, Apotti is owned by the Helsinki and Uusimaa Hospital District (Uusimaa is the region of Southern Finland), the City of Helsinki, the wellbeing-service county of Vantaa and Kerava, and the wellbeing-service counties of Eastern, Western, and Central Uusimaa. With such ownership and being a non-profit

organization, Apotti does not actively engage in competition on the market. We assume that the organizational culture at Apotti is close to that of public organizations, which explains the low scores in Table A2.

Arguably, because of the organizational culture, the majority of the *mean scores for the actor* "digitalization leader within a public organization" are 6 and above (see Table A1).

Agreement between the respondents A, B, C, and D is moderate – the difference between the highest and lowest respondent-given score is mostly 1 or 2 (with 6 being the largest possible difference). The following skills and tasks had the largest mean-score differences:

- Mean-score difference 4:
  - S2.1 "Private organization is more innovation-driven and risk-taking than the public partner that operates the e-service".
  - T2.2 "Promote the e-service solution, which facilitates the adoption of the e-service".

- Mean-score difference 3:
  - T1.9 "Initiate and manage changes in the organization to facilitate the e-service development and adoption, and facilitate digital transformation".
  - T2.3 "Disrupt bureaucracy and governmental inertia within the public-private partnership, help the public organization embrace changes, and eventually the digital transformation".

S2.1, T2.2, and T2.3 are skills and tasks of the actor "private organization within a public-private partnership". Apotti did not see itself in this role, which may have facilitated the disagreement between the respondents. Also, T1.9 does not seem relevant because Apotti is a relatively new organization (since 2015), created to run healthcare e-services.

6.2 Comments Regarding Skills and Tasks

Table 3 shows some of the respondents' comments regarding specific skills and tasks. In general, comments such as "All of them are essential," and "It encompassed human skills, technical aspects, organizations, and policies. Funding was likely mentioned as well, wasn't it? All of these elements are crucial" indicate that the framework's skills and tasks are relevant for active ownership of a public e-service.

Table 3. Comments regarding specific skills and tasks

Skills and tasks	Comments
S1.1 Charismatic leader with strong people skills – a natural influencer who can motivate, inspire, and rally people	Respondent A emphasized the importance of the people's and leadership skills on multiple occasions. Respondent B raised the importance of the people's skills, together with communication skills. Respondent C mentioned the vitality of the people's skills.
S1.2 Strategic leadership skills enable long-term planning, policy development, and high-level decision-making for digital transformation	Respondent A stressed the importance of long-term planning.
S1.6 Business-IT alignment skills require deep knowledge of the business processes and the operational needs at the organization on one side, and ICT and the digital enterprise architecture on the other side	Respondent B emphasized the technical and systems understanding as critical success factors in public e-services. Respondent D stressed the need to master the principles of software engineering.
T1.5 Lobby simplification of laws and regulations for digitalization	Respondent A acknowledged that "the legislation is very strict".

Table 3. Continued

Skills and tasks	Comments
T1.8 Break established routines, resistance to change T1.9 Initiate and manage changes in the organization to facilitate the e-service development and adoption, and facilitate digital transformation	Respondent B repeatedly commented on the importance of change management skills.
T1.10 Bridge departmental silos within the public organization	Respondent A commented that it would be beneficial if "e-services would work together with other healthcare providers".
T1.14 Make sure that the e-service is perceived as useful and easy to use by the citizens	Respondent C: "The system needs to be designed for the end users, meaning it is ergonomic and user-friendly. It provides the necessary information services that other official personnel require at that moment, without burdening them with unnecessary clicking. This ease of use is currently another critical success factor."
T1.16 Market the e-service towards citizens	Respondent C mentioned that marketing is important at a certain level, particularly towards citizens.

6.3 Potential New Actors and Partnerships

Participant B proposed that a publicly held limited liability company could serve as a new type of actor in the role of an active owner of a public e-service. Apotti was mentioned as an example of such an actor positioned "in the middle of private and public". Apotti has the organizational culture of a public organization, while Apotti itself does not own public e-services. Instead, it operates the e-service solutions for other public organizations like an outsourcing provider.

A recurrent theme during the interviews was a cross-sectoral working group consisting of lawmakers, e-service providers, user organizations, and domain experts. The respondents emphasized the need for integrated, cross-sectoral collaboration in the development, legislation, and governance of public e-services.

Respondent A emphasized that individuals involved in e-service development should possess both broad and deep expertise: "First of all, they need to have a good overall understanding, and then, of course, a deep understanding of a specific issue – so they can bring that expertise into the working group." This reflects the need for multi-perspective input and collaboration that goes beyond siloed sectors. Further, Respondent A advocated for "real network-based collaboration" at the national level and stressed the value of involving lawmakers early and directly in the process: "There should be relevant actors involved, so that shared discussion and mutual understanding could be achieved – because in my view, laws are often handled far too rigidly, without truly understanding what kinds of impacts they actually have." These insights suggest that legal frameworks and technological realities often fail to meet in practice, and a structured, multidisciplinary setting could help bridge that gap. Moreover, the suggestion that "health service providers, the organizations delivering the digital systems for health services, and ministries and others can all come together to consider what a good e-service really is" (Respondent A) reflects a vision for nationally coordinated collaboration, where multiple stakeholders define shared goals and align on implementation strategies. A formalized working group could serve as the mechanism for realizing this vision.

Nevertheless, Respondent B cautioned against granting ministries e-service ownership power: "I've thought about whether other owners – such as ministries in our sector – could take on more ownership, but I do not really want them to take a bigger role in ownership over these things." This concern points to the distinction between participation and ownership. Ministries and other governmental bodies could be valuable members of such a multidisciplinary group without holding

direct ownership. In this way, the group would support co-creation and coordination rather than control-shift.

Associations and third-party organizations could help promote e-services. Respondent B: "Perhaps if we think about citizens, and for example how they use digital services, then third-party organizations and actors could potentially play a role in supporting citizens in using our services like Maisa." These organizations could help bridge gaps in digital literacy, particularly among populations with lower technical competence, by guiding users in navigating e-health services and accessing relevant information.

In addition to supporting individual users, third-party organizations can contribute at a more systemic level. For instance, the Finnish Medical Association could advocate digital transformation, foster a positive discourse around digitalization, and build user competence. (Respondent D): "So maybe the task of the associations could be to advocate for the positive sides and possibilities of digitalization […] and also to bring knowledge and perhaps increase competence within the user base."

Finally, Respondents B and D emphasized that ownership and goal-setting should lie with the user organizations, for instance, healthcare providers – hospitals, primary care providers, etc.

6.4 Possible Gaps in the Framework

Respondent A emphasized that the ability to navigate existing laws and regulations could be a valuable skill for active owners of public e-services. This addition could enhance the framework to better capture the legislative dimension of active ownership of a public e-service.

Respondent A also raised the importance of close cooperation between organizations involved in the delivery of public e-services: "A close partnership between public client organizations – those matters should be advanced in cooperation. That perspective could perhaps be emphasized a bit more [in the framework]." Additionally, respondent A highlighted the importance of cooperation with lawmakers: "And then, specifically, cooperation with lawmakers at the ministry level. Also, from the legal perspective, there should be representatives involved so that shared discussion and mutual understanding could be achieved, because often, in my view, laws are handled very rigidly, without truly understanding what kind of effects they actually have." These might not be emphasized sufficiently in the current framework.

Respondent A noted that reflecting on the concept of active ownership can be inherently difficult due to its contextual nature: "It is quite challenging for us to reflect on these questions ourselves, because active ownership probably appears very differently depending on the position you hold." This comment suggests that the current framework might benefit from a more nuanced treatment of positionality, i.e., acknowledging that perceptions and practices of active ownership may vary significantly depending on whether an individual is in a strategic leadership role, an operational role, or somewhere in between. Respondent B elaborated on this idea further, pointing out that "some of the questions clearly relate to those in strategic leadership or official roles, but if we think of active ownership as something anyone could, in principle, embody, as some of the statements suggested, then the qualities required might differ from what would be expected of someone in a formal position."

Respondent B went on to note that "I kept thinking about the different levels, but for now I focused on the strategic level, because the questions seemed to lean more in that direction. However, there is an interesting idea for further research – how active ownership differs depending on one's formal role within the organization and the level at which one operates. For example, if you are part of a working group advancing a project, you might not need these particular qualities, but rather emphasize different ones. That is what I was reflecting on." This points toward a gap in the framework's current design: a lack of attention to how ownership operates across hierarchical levels and how the required qualities may vary accordingly. Integrating this into the framework could make it more applicable across a broader range of roles within public e-service ecosystems.

Respondent B emphasized the importance of the agency that provides the public service: "In general, I believe it is important that the organizations wanting to use these services also take ownership and define their own goals. Ownership, change management, and similar elements should reside within the user organizations. That is crucial for the services to succeed in reaching their objectives."

Communication skills were another area emphasized by the respondents, particularly in how information is presented to the recipients. Respondent C: "If it seems like an engineer walks in and tells a neurosurgeon how something should be done – that is the final mistake you can make. The likely reaction would be that this person needs to be escorted out of the operating room." This highlights a potential blind spot in the framework: the need for strategic communication that respects professional domains and expertise hierarchies. Adapting messaging to the audience's context could be critical for the successful implementation and adoption of e-services.

6.5 Lessons Learned

Because of the small sample size and the fact that we studied only a single domain, this should be considered a preliminary, formative assessment of the framework. Nevertheless, we drew some lessons.

We define that the skills and tasks that have received their mean score of 6 or higher (7 is the maximum) have been *confirmed as relevant* for successful management of public e-services.

The main leadership skills – charismatic leadership, strategic leadership, and strong management skills within the organization – have been confirmed. Most of the tasks of the actor "digitalization leader within a public organization" have been confirmed: creating the vision and roadmap of digital transformation within public service delivery, acquiring political support for implementing the vision, acquiring support and managing changes within the public organization, and facilitating the adoption of public e-services by citizens.

Not confirmed as relevant are "courageous ice-breaker", "informal leader – a passionate, hands-on individual who pushes for e-service adoption and modernization", and the skills of business-IT alignment. Apotti is a comparatively new organization created for developing and operating public e-services. Hence, Apotti has never experienced resistance to change regarding digital transformation, nor any need for business-IT alignment. The three skills could be of more importance in older public organizations, and in countries with a lower e-government development index than that of Finland.

Not confirmed was the task (or difficulty) of recruiting a skilled workforce. Apotti develops its e-services on top of the Epic[†] EHR electronic health records' system, which means that Epic takes care of the skilled workforce, and apparently can provide the necessary workforce on a consultancy basis as long as Apotti is willing to pay. Possibly, because we have an active co-owner, "private organization within a public-private partnership", recruitment of e-service staff becomes a lesser headache for public organizations. We need more empirical data to confirm that.

A bit of a puzzle is "seek and maintain collaboration with public and private stakeholders". The task has received a mean score of 4.75, although the respondents have stressed the importance of partnerships (see Section 6.3). Apparently, the meaning of "collaboration" was not clear.

Not confirmed were the skills and tasks of the actor "private organization within a public-private partnership", as explained in Section 6.1.

The assessment has provided some ideas regarding the future data collection. The statement "it is quite challenging for us to reflect on these questions ourselves, because active ownership probably appears very differently depending on the position you hold" states that a person in a strategic management position may have difficulty judging operational skills and tasks; the same applies to a person in an operational management position regarding strategic issues. In the future, a representative sample of respondents from both managerial positions should be interviewed.

[†] https://www.epic.com/

The respondents emphasized a need for a cross-sectoral working group consisting of lawmakers, e-service providers, user organizations, and domain experts. Such a working group does not serve as an active owner of a public e-service; rather, it functions as an advisory and advocacy body that fosters an ecosystem for thriving e-services in a specific subject domain (e.g., healthcare). In the future, we need to refine the tasks regarding collaborations within the domain, across organizational borders.

Different areas of expertise, such as strategic and operational management, as well as the cross-sectoral working group, suggest various organizational roles. In this research, we avoid organizational roles in order to keep the framework simple and applicable. It is up to the organization to find staff with the necessary skills and to assign the tasks accordingly.

Regarding the organizational roles, Tsai and Zdravkovic [76] have proposed roles and responsibilities in a digital business ecosystem, where almost every responsibility overlaps with one or several skills and tasks in our framework. The only exception is the responsibilities of the end user, who would be citizens in the context of our framework. Although citizens are recipients of e-services and important stakeholders, our framework does not impose any responsibilities on them. Both the ecosystem and the framework were developed independently; therefore, we regard the overlap as a token of mutual endorsement.

6.6 Refinements of the Framework

Based on the received feedback, we have made some elaborations of the framework in terms of the tasks' representation structure and definition clarity.

6.6.1 Strategic vs. Operational Tasks, Strategic Responsibilities of An Active Owner of A Public E-Service

Because the respondents found it somewhat difficult to assess the tasks of an active owner of a public e-service across strategic and operational competencies, we divided the tasks into strategic and operational ones, as shown in Figure 3. We used the mapping of the tasks to the components of transformational government (see Figure 2) to do the split. Strategic tasks are those of lobbying for the public digital transformation; they use the expected impacts as an argument. Also, strategic tasks help to build and maintain the external and internal pressure in order to initiate and carry out the transformation. Operational tasks require external and internal pressure to achieve their goals; operational tasks implement the transformation.
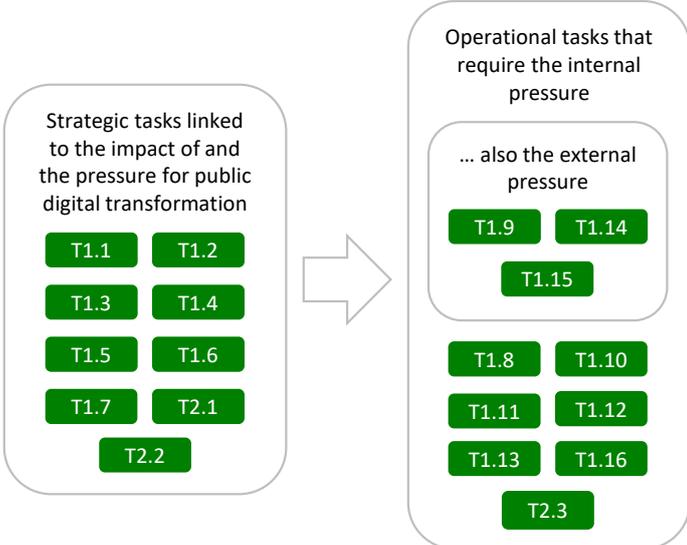
Figure 3. Tasks of an active owner of a public e-service as strategic and operational ones

Figure 3 clearly separates the strategic and operational tasks. Furthermore, Figure 3 demonstrates two strategic responsibilities of an active owner of a public e-service: (i) seeking support to initiate and maintain public digital transformation, which includes (ii) inducing internal pressure in the organization to do the transformation (T1.6, T1.7), because most operational tasks require that internal pressure (see Figure 2). Then, of course, the active owner needs to manage the transformation through the operational tasks.

6.6.2 Changes in the Definitions of Framework's Tasks

After the assessment, we changed the wording of task T2.1 from "Take the risks, create innovative solutions, compete on the market" to "Take the risks, create innovative IT products, strive to outperform similar e-service solutions". The old wording had received a medium-high mean score and very divided opinions (see Table A3 in the Appendix), and we do not know whether the risks, competition, or innovation were not relevant for Apotti. We shifted the competition to excellence among similar e-service solutions, while leaving the risks and innovation to drive this excellence.

Furthermore, we changed the wording "Integrate e-services horizontally across organization borders, build a one-stop shop that solves more complex use cases, which facilitates adoption of e-services by citizens" to "Work to bridge organizational silos to deliver an integrated e-service capable of solving complex use cases", which is now task T1.13. When the original wording was formulated, we meant actually bridging the organizations. The original wording received a medium-high mean score and divided opinions (see Table A3 in the Appendix), while respondents repeatedly emphasized the importance of cooperation within the domain (see Section 6.3). Respondent A commented that it would be beneficial if "e-services would work together with other healthcare providers", and "ideally, the systems would be more unified on a national level". On the same note, the task "T1.10 Bridge departmental silos within the public organization" received a high mean score.

7 Conclusions

The underpinning rationale of active ownership of a public e-service assumes that the e-service has better chances to thrive (meaning to be more usable and to be more used) if the e-service has an active owner that is committed to the success of the e-service and acts on behalf of the e-service. The framework of active ownership of a public e-service has defined seven skills and nineteen tasks of an active owner ("digitalization leader within a public organization") and an active co-owner ("private organization within a public-private partnership") of a public e-service.

The *theoretical contributions* of this article are:

- Enrichment of the body of descriptive e-government success influencers (they analyze and document the state of affairs) by a prescriptive framework of specific skills and tasks that facilitate the success of a public e-service (see Section 3).
- A "paradigm shift", entailed by active ownership of a public e-service, in the management of e-government engagements: instead of fragmented managerial responsibilities distributed across time-restricted projects, a public e-service receives holistic management led by one accountable entity throughout the lifecycle of the e-service. This should, arguably, ease the problem of "shelfware projects" and "orphan outputs".
- Alignment of the tasks of an active owner of a public e-service with the components of transformational government (see Section 5). The alignment suggests that these tasks are a subset of those of public digital transformation.
- A relationship between strategic and operational tasks of an active owner of a public e-service (see Section 6.6.1). The strategic tasks identify two strategic responsibilities of the active owner: (i) seeking support to initiate and maintain public digital transformation, which

includes (ii) inducing internal pressure in the organization to do the transformation, because most operational tasks require that internal pressure to achieve their goals.

Sometimes it is difficult to separate the *limitations* of the current state of research from future research, because a current limitation serves as input to future research. Nevertheless, a clear limitation of the current framework is the limited scope of its evaluation. Because the data sample is small and confined to a single domain (healthcare), we regard the initial assessment as an exploratory test of the framework, a formative evaluation rather than a definitive judgment of the framework's quality.

For *future research*, we plan to continue evaluating and refining the framework. There are several possible dimensions of evaluation. A multiple-domain evaluation from the perspective of strategic and operational competencies would test the cross-domain validity of the framework. The data collection is expected in Europe, which would imply a Western bias in the framework. An additional data collection in non-Western countries (primarily in developing and middle-income countries) would test the generalizability of the framework across national cultures and e-government development levels, as the adoption of digital public services is influenced by cultural factors [77].

Comparative case studies are another dimension of evaluation. Given that our interest in active ownership of public e-services has originated from the poor adoption of the German eID [4], we may explore the framework by contrasting successful and less successful implementations of national electronic identification systems. Also, contrasting centralized and decentralized organizational governance models and exploring the framework within the context of these models would further enrich the framework.

Longitudinal studies would help us better understand how active ownership roles, strategic and operational competencies, and different tasks complement each other and manage the lifecycle of a public e-service.

To strengthen the theoretical contribution of the research, we aim to explore the skills and tasks related to active ownership of a public e-service through the lens of leadership and public-sector management theories.

For *practitioners*, the framework may serve as an inspiration and a reference for reorganizing responsibilities and coordination between digital transformation teams with a focus on e-services and public value generation rather than on projects. The framework may serve as a checklist to assess whether (i) a public e-service receives a sufficient range of managerial attention it requires, and (ii) the organization possesses the necessary skill set.

As the framework gets continuously validated and its sets and definitions of skills and tasks are being refined and confirmed, *policymakers* may use the framework to develop public e-service management policies similar to ITIL practices [16].

Having practitioners in mind, we consider a research direction for the operationalization of the framework. We aim to develop a method for applying the framework in a public organization to generate feedback that facilitates the organization's digital transformation.

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Appendix

The tables below present the scores assigned by respondents A, B, C, and D to the skills and tasks related to active ownership of a public e-service, using a scale from 1 (not important) to 7 (extremely important).

Table A1. Scored skills and tasks of the actor "digitalization leader within a public organization" (see Table 1 in the main body of the article for the definitions of the skills and tasks).

Skills (Si.j) and Tasks (Ti.j)	A	B	C	D	Mean	Max-min
S1.1	6	7	5	6	6	2
S1.2	7	7	6	7	6.75	1
S1.3	5	6	4	6	5.25	2
S1.4	5	6	5	7	5.75	2
S1.5	7	7	6	6	6.5	1
S1.6	6	6	5	6	5.75	1
T1.1	6	7	5	6	6	2
T1.2	6	7	5	7	6.25	2
T1.3	5	7	6	7	6.25	2
T1.4	7	6	5	6	6	2
T1.5	7	7	5	7	6.5	2
T1.6	7	7	5	7	6.5	2
T1.7	6	7	6	6	6.25	1
T1.8	6	7	5	6	6	2
T1.9	7	7	4	6	6	3
T1.10	7	6	6	7	6.5	1
T1.11	5	6	6	5	5.5	1
T1.12	5	5	4	5	4.75	1
T1.14	6	7	6	5	6	2
T1.15	7	6	6	5	6	2
T1.16	7	7	5	6	6.25	2
Mean	6.15	6.55	5.25	6.1	6.01	

Table A2. Scored skills and tasks of the actor "private organization within a public-private partnership" (see Table 2 in the main body of the article for the definitions of the skills and the tasks).

Skills (Si.j) and Tasks (Ti.j)	A	B	C	D	Mean	Max-min
S2.1	5	6	2	6	4.75	4
T2.2	7	5	4	3	4.75	4
T2.3	6	6	4	7	5.75	3
Mean	6	5.67	3.33	5.33	5.08	

Two tasks have changed their wording after the assessment:

a) Old wording of T2.1: Take the risks, create innovative solutions, compete on the market
   New wording: Take the risks, create innovative IT products, and strive to outperform similar e-service solutions

b) Old wording for T1.13: Integrate e-services horizontally across organization borders, build a one-stop shop that solves more complex use cases, which facilitates the adoption of e-services by citizens
   New wording: Work to bridge organizational silos to deliver an integrated e-service capable of solving complex use cases.

The old wording received the scores shown in Table A3.

Table A3. Old wording scores

Old wording case	A	B	C	D	Mean	Max-min
T2.1	6	5	1	5	4.25	5
T1.13	7	4	5	4	5	3