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Cross-Organisational Collaboration Management of Digital Innovation in the Public Sector – The Case of the Estonian Employment Register

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Abstract:

Cross-organisational collaboration management has been an important topic in academic literature, representing the nexus of modern governance arrangements. Organisational boundaries are becoming increasingly blurry with continuous digitalisation through new interaction patterns, resulting in the proliferation of cross-organisational collaborations across sectors and within the public sector. This study contributes to the existing literature by analysing cross-organisational collaboration management within the public sector through the case of the Estonian Employment Register. The author conducted semi-structured interviews with engaged stakeholders and coded the data with a concept-driven and data-driven coding scheme for the analysis. The interviews were analysed for occurrences and co-occurrences. The case highlights the role of system context (pre-established connections, decentralisation, digital infrastructure), process challenges (differences in perspectives, organisation-centric approach, power imbalances) and management interventions (contingent leadership, shifting roles, trilateral connections) for cross-organisational collaborations. The findings demonstrate the importance of pre-existing informal connections in shaping the available alternatives for instruments. Digitally capable agencies can capitalise on opportunities for digital innovation through their technological capability and reputation. The key challenges remain with expanding the cognitive framework beyond the established interaction arenas to adapt to perspectives beyond the initial networks. The ability to maximise the potential of digital innovation is also contingent on designing compatible human interaction processes to manage machine interactions.

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Keywords:
collaboration, digital innovation, institutional design, leadership

1. Introduction

Over the past few decades, public administrations have experienced the growing relevance of cross-organisational collaborations. Heightened turbulence, increasing user expectations, the complexity of problems and dwindling resources have resulted in the pressure to adapt to changing conditions (Hartley et al., 2013; Bryson et al., 2006; Carstensen et al., 2023). However, the inability to solve problems in isolation has shifted perceptions of the benefits of collaboration, also known as collaborative advantage, resulting in a proliferation of new collaborative initiatives (Vangen & Huxham, 2009; Torfing, 2019). Digital innovation has only increased perceptions of the relevance of cross-organisational collaborations (Pardo et al., 2010). The demands towards increasingly personalised and customer-centric digital solutions require crossing organisational boundaries to design human interactions that can coordinate machine input from different automated processes (Bertot et al., 2016; Kattel et al., 2019; Desouza et al., 2020). Previous research has highlighted the complex dynamics between digital innovation and collaboration – on the one hand, it serves as a precondition for change in digital innovation through better-informed decision-making and broader acceptance, yet the new interdependencies also lead to opportunities for collaboration through digital innovation (Vial, 2019).

The management of these collaborations incorporates voluntary instruments alongside existing traditional hierarchical measures, as new stakeholders with varying interdependencies necessitate different approaches (O'Leary & Vij, 2012; Emerson et al., 2011; Ansell, 2016). However, the study of these collaborations has remained inconsistent due to a number of reasons, from limited consideration of external factors to oversimplified conceptualisation of collaborative arrangements (Emerson et al., 2011; Bouckaert et al., 2010). The existing literature often focuses on cross-sectoral collaboration between governmental and private or third sector actors (for example, see Ansell & Miura, 2019) with management within the public sector receiving limited attention (for example, see Picazo-Vela et al., 2017). This research aims to fill this gap by focusing on cross-organisational collaborations within the public sector, providing a unique contribution to the field. Analysing it would improve understanding of the enablers and barriers of collaboration and highlight best practices and shortcomings for collaborative digital initiatives. Furthermore, studies of cases beyond the dominant Anglo-American and Scandinavian traditions would inform researchers regarding the applicability of existing knowledge in different contexts.

This study analyses factors relevant to cross-organisational collaboration within the public sector through a single case-study approach. The chosen case, the Estonian Employment Register, provides a successful example in a context supportive of digital

innovation that has become the basis for further evolution of the solution. The paper uses qualitative content analysis to systematise and analyse distinct factors present in qualitative data (Schreier, 2012). The main research questions of the paper that will be studied are the following:

- What are the key aspects in the system context, collaborative process challenge and management intervention that have affected the development of the Estonian Employment Register?
- What are the institutional and management-related enablers, barriers and future challenges of the Estonian Employment Register?

The paper is divided into five parts. The first section covers the existing literature on cross-organisational collaboration, which informs the analytical framework. The above is divided into three main parts: system context, collaborative process challenges and intervention measures. The second section covers the research methodology, followed by the third section focusing on the research findings from the case. Two final sections are dedicated to the discussion and conclusions from the study.

2. Cross-organisational collaboration management

The concept of collaboration varies from continuum based to dichotomous dynamic vs static approaches that cover a number of aspects from the engagement of various actors as well as the ability of the collaboration to evolve beyond its initial intentions (Peters, 2015; O'Leary & Vij, 2012). For the definition of collaboration, the author relies upon Huxham (1996), who outlined collaboration as "A form of working in association with others for some form of mutual benefit" (Huxham, 1996). Collaboration can vary based on the composition of stakeholders, goals and rationale, and imposed rules (Pardo et al., 2010; Agranoff, 2006). With the different forms of collaborative arrangements, there is also a variation in relevant affecting factors, including the system context, process challenges and management.

2.1. System context

Collaborative arrangements are affected by several external factors creating opportunities or constraints, from broader institutional framework to pre-established cross-organisational relations and cognitive convergence (Emerson et al., 2011; Pollitt & Bouckaert, 2011; Jugl, 2022). The existing formal setting, from administrative features and institutional arenas, shapes individual stakeholders' approaches to new initiatives (McGuire, 2002; Jugl, 2022). The legal framework provides public actors the mandate and autonomy to steer change (Bingham, 2008). It can vary from mandates to a single organisation within a policy field to overlapping jurisdiction between agencies, necessitating interactions and resource competition (Kenis & Provan, 2006; Bingham,

2008), which shapes the structural embeddedness by creating formalised interaction arenas (Quick & Feldman, 2014). Alongside formalised arenas, the strength of informal connections can alter the use of resources and perspectives (Ansell et al., 2023). In the context of small states, this is even more accentuated by the fact that an individual fundamentally impacts the competencies and capabilities of entire organisations (Randma-Liiv & Sarapuu, 2019).

With the advent of digital innovation, the system context has expanded to include various technological determinants. The underlying technological infrastructure and motivation for standardisation shape the technological readiness of actors (Gil-García & Sayogo, 2016). The legal framework includes conditions for ownership, data-sharing, information protection and limitations surrounding sensitive data and cross-organisational data exchange (Margetts & Dunleavy, 2013). The technical architecture and the interoperability with other digital solutions shape potentialities for new initiatives (Pardo et al., 2010; Gil-García & Sayogo, 2016). Intra-organisational drivers also possess a significant role (Bryson et al., 2006). Organisational culture shapes assumptions and perceptions of individuals regarding problems and solutions, which creates biases towards specific approaches (Pollitt & Bouckaert, 2011; Kattel et al., 2019). Establishing an innovation-oriented culture affects the ability to perceive benefits from innovation based on adaptability and organisational learning (Van Der Voet et al., 2015; Wynen et al., 2013; Salge, Vera, 2012). The adoption of digital technologies is contingent on the capacity of stakeholders to interpret and incorporate solutions into existing processes, with increasing complexity resulting in the possibility towards unintended deviations (Bullock et al., 2020). The external factors from the system context can act as inhibitors and enablers towards implementing new digital innovations, shaping the environment where the new solutions are introduced and providing possible avenues for further deviation and evolution.

2.2 Collaborative Process Challenges

A collaborative process entails different challenges that emanate from external and internal sources affecting stakeholders (Agranoff, 2006; Bryson et al., 2006; Emerson et al., 2011). The challenges can be related to substantive aspects, from varying perceptions of problems and solutions, strategic or institutional dimensions, and disparity in resources committed and conflicting goals. Complexities can emerge on a substantive, strategic and institutional level through challenges with cognitive perception, organisation-centric goalsetting and limitations from overlapping jurisdictions (Klijn & Koppenjan, 2015). The substantive complexity manifests in interpretations of problems suffering from bounded rationality and "blind spots" (Raadschelders & Whetsell, 2017; Head & Alford, 2013). The reliance on expertise-based solutions derived from empirical knowledge does not consider the value-based environment affecting decision-making (Head, 2022; Wegrich, 2019).

Organisational values, resources, and priorities shape the desirable goals, which leads individual actors to choose their behaviour, leading to strategic complexity and

power imbalances (Klijn & Koppenjan, 2015). Varying perspectives, disciplinary approaches and organisational biases steer organisational behaviour towards bartering (Torfing, 2019). In a context of competition for resources and support, actors are further incentivised to opt for strategies towards autonomy (Wegrich, 2019). The strategic behaviour can create distortions through asymmetric power positions in the collaboration (Huxham, 2003; McGuire, 2002; Hartley et al., 2013). Distortions can occur through various means, from limiting the engagement of different actors to prioritising preferred perspectives over others by limiting negotiations.

Actors operate in various interaction arenas, each with distinct values, norms and rules, leading to interdependencies between arenas, which fosters distinct patterns of perceptions and interactions to appease the stakeholders in different arenas (Klijn & Koppenjan, 2015; O'Leary & Vij, 2012). Actors must balance commitment and resource use between the interaction arenas (Klijn & Koppenjan, 2014), which can foster conflicts, as actors face rapid shifts in interdependencies with highly turbulent situations subjecting actors to previously unknown domains with limited resources (Boin, 2019).

Another critical challenge collaborations may face is risk (Brown & Osborne, 2013). Public sector organisations are subject to more scrutiny than private initiatives with a limited tolerance of failure. The uncertainty present in innovative initiatives creates an amplified perception of risks (Flemig et al., 2016). Risks can originate from different sources, including unexpected changes in behaviour and reactions from users, engaged organisations and the wider community (Brown & Osborne, 2013). Failure within the arrangement either with the solution or with participation can lead to a loss of resources and legitimacy for organisations (Flemig et al., 2016).

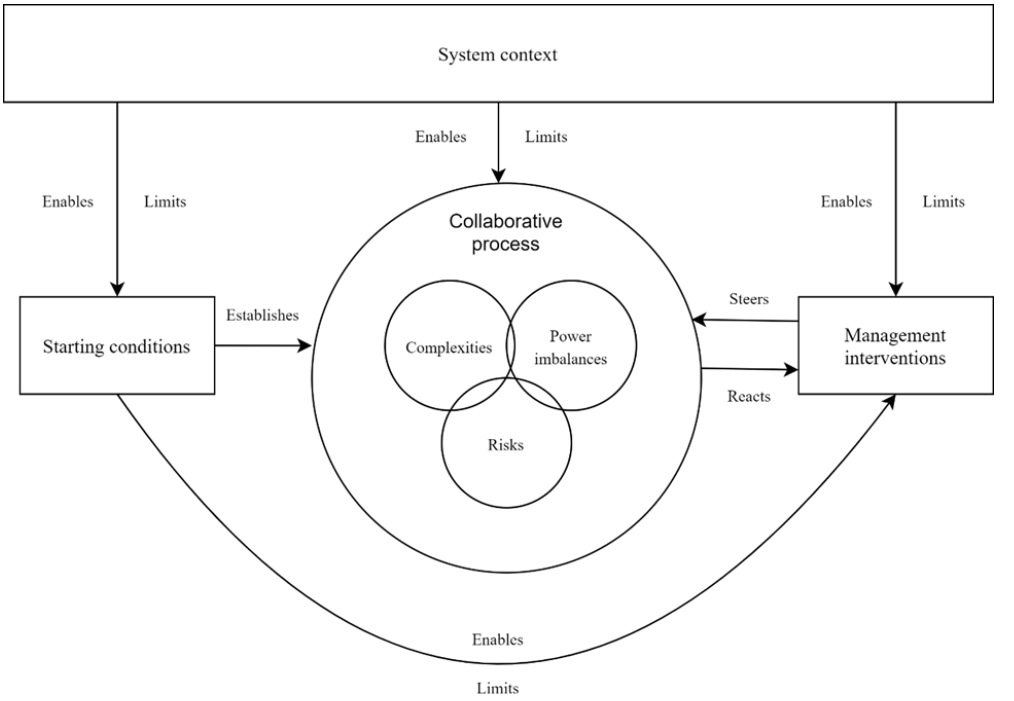
2.3 Management intervention

The actors can utilise a variety of instruments to steer collaborative processes, which is crucial for both the management of the problems experienced during the collaborative process and also for managing the idiosyncrasies of the context. A prominent differentiation is between the use of institutional design (structure) and leadership (agency) (Torfing, 2019). Institutional design is crucial for sustaining long-term collective behaviour, as the fixed rules, values and norms, both formal and informal, provide necessary predictability and stability (Klijn & Koppenjan, 2006). Rules can refer to interaction norms, including information exchange, membership entrance, role designation, or the surrounding arrangement, including mandate and task deference (Klijn & Koppenjan, 2006; Torfing, 2019). Design must balance agility for maintaining adaptability in turbulent situations and stability for providing throughput legitimacy (O'Leary & Vij, 2012; Carstensen et al., 2023). The power distribution through administrative and coordinating activities enables resource dependencies between various stakeholders based on the actor's position, surrounding environments and goals (Kenis & Provan, 2006). Positive feedback mechanisms increase stakeholders' willingness to adapt and contribute (Hartley et al., 2013). Negative feedback or unwillingness to collaborate can increase participation aversion (Wegrich, 2019).

Leadership is vital for the agility to steer stakeholders actively (McGuire, 2002). Agency can be exhibited both formally and informally, affecting day-to-day and strategic management (Ansell & Gash, 2007). Agency may exhibit various forms, with a prominent distinction being the transactional vs facilitative role dichotomy (Ricard et al., 2016; Bardach, 2015). Transactional leadership depends on stability, as it relies on agreed-upon institutional arrangements, where top-down command-oriented measures remain the driving force (Ricard et al., 2016; Jacobsen & Anderson, 2015). Facilitative leadership encompasses a form of leadership that strongly focuses on ensuring a positive environment for participation by activating stakeholders through framing to incentivise increased contribution, mediating to mitigate negative cycles and catalysing to foster new ideas (McGuire, 2002; Torfing, 2019). A leader's position is enhanced through positive feedback loops and "small wins", as the primary power source originates from the existing trust, shared meaning and beneficial framing (Head, 2022; Lewis et al., 2017).

Figure 1:

Visualisation of the analytical framework



Source: Author's own, based on literature review, 2024

3. Research methodology

This paper opted for a single-case study methodology with an extreme case within the Estonian context and a more typical case (considering the level of technological capabilities of tax agencies) within the global context. An extreme case enables the research to find new possible dynamics that have received limited insight into the literature (Van Thiel, 2014). The Employment Register represents a successful cross-organisational initiative with positive perceptions developed over the subsequent years as a building block for solutions that have enabled rapid adaptation during crises. Studying cases of digital innovation initiated by executive agencies in a conducive environment enables the analysis of the conditions for overcoming challenges and fostering change. Single-case study research provides rich empirical information necessary for subjects in public administration, especially given their uniqueness and is suitable for more explorative approaches that this study adopted (Van Thiel, 2014).

Data collection and analysis involved a qualitative content analysis of semi-structured interviews and supporting documents. The analysed period involves a timeframe from 2013 to 2019, whereby the document search aimed to comprehend the perspectives of engaged stakeholders and the framing within the cross-organisational collaboration. The document search relied on a checklist of different documents (Bazeley, 2013), including strategic documents, legislative acts, press releases, media statements connected with the collaborative arrangement, and key processes related to employment data. The strategic documents included development plans for the public sector organisations covering the development period of 2014, which were further complemented through a search of relevant legislative acts (nine legislative acts and one regulation) through two information systems containing system architectural and legal information - Administration system for the state information system (RIHA) and information system for the information of the proceedings of the legislative drafts (EIS). Finally, the paper also covered press releases from engaged stakeholders regarding the solution.

The author interviewed six individuals during the period of October-November 2019. The paper adopted a combination of snowball and convenience sampling. The sample was developed based on the information received from the interviews and the RIHA search. Engagement from the initial phase was deemed a necessary criterion, but the level of engagement was allowed to vary to provide differences in perspectives. The interviewees involved the representatives of the core and peripheral actors involved with the initiative. The snowball sampling failed to produce interviewee opportunities with some peripheral actors (Police and Border Guard Board; Social Insurance Board), which was linked to both the limited relevance of the stakeholders as well as issues with personnel turnover. It resulted in a limitation, affecting the perspectives provided for the study, which was mitigated by the document search. The research findings were anonymised, and each interviewee was allocated a code (between I1-I6), which was ordered according to their relevance (interviewee perspective, role and organisation)

within the initiative. The roles included project manager, working group member, steering committee member, and member for follow-up developments for the study. Some interviewees possessed dual roles (i.e., the steering committee and working group member), increasing their relevance within the initiative. I1 and I2 reflect the coordinator perspective, I3 and I4 reflect the core actor perspective and I5 and I6 reflect the peripheral actor perspective. The interviews lasted between one hour and 20 minutes and two hours.

The analysis involved several stages of coding with a focus on occurrence and co-occurrence between codes. The coding scheme is based on concept-driven and data-driven approaches (Schreier, 2012). The deductive approach (concept-driven) for developing an initial coding scheme was based on a review of innovation, collaboration, public management, public administration, technology implementation and e-governance literature, focusing on middle-range theories. The theoretical literature provides the space for specific a priori assumptions for the findings, but the data-driven approach maintains the flexibility for any emergent themes (Bazeley, 2013). A coding scheme was used that consists of 81 codes divided into four main categories (for more information on codes, see Appendix I)[2]. The main categories involved meta-codes, system context, collaborative challenges, and intervention measures. The code definition included its name, main category, definition, examples, and rules in writing memos. The segmentation criteria of the coding unit were based on the meaning unit, which represents a standalone idea within the text. The use of semi-structured interviews guided the choice to approach the segmentation criteria through the meaning unit instead of another formal criterion (i.e. paragraph). The segmentation process resulted in 308 coding units related to the main categories and their respective subcategories. The codes were used 733 times during the coding process of the interviews, with a coding unit coded on average 2.37 times. The author conducted two test coding sessions during separate sessions to test the validity of the results and limit possible researcher bias. The validity of the results was tested through the percentage of agreement (PoA) and the kappa coefficient, conducted through the MaxQDA 2018 program. Percentage of agreement refers to a measure to test intercoder reliability by calculating the number of times the coding units are coded in agreement with the codes, divided by all the coding units (Schreier, 2012).

$$PoA = \frac{Number\ of\ coding\ units\ on\ which\ coders\ agree}{Total\ number\ of\ coding\ units} \times 100$$

The agreement percentage has limitations, as it does not consider the possibility of agreements by chance. Due to the complexity of the coding scheme, the possibility of

2 The initial version of the coding scheme was developed during the research within the H2020 project TROPICO (GA no. 726840)

chance agreements was reduced considerably. To further mitigate the potential for chance agreements, the intercoder reliability was also checked through the kappa coefficient. The kappa coefficient takes into account the probability of two coders randomly selecting and agreeing on the same code.

$$Kappa\ coefficient = \frac{(percentage\ agreement - agreement\ by\ chance)}{(1 - agreement\ by\ chance)}$$

The agreement by chance refers to the hypothetical probability of chance agreement. Within MaxQDA, it is calculated through 0.5 to the power of the number of codes selected for analysis. On a subsample of 20 per cent of all coding units, a percentage of agreement of 82% per cent and a kappa coefficient of 0.82 were achieved. Although some of the subcategories possessed a lower level of PoA than the abovementioned, the coding scheme was deemed acceptable. The depth of the coding scheme led to a higher level of inconsistency during coding than is usually the case with a single coder, lowering the kappa coefficient and percentage of agreement. The level of agreement achieved was deemed acceptable (Neuendorf, 2002). The results are summarised through the respective categories and subcategories. The chosen methodology entails two main limitations concerning validity and reliability. Firstly, the findings are difficult to generalise due to context-specificity (Van Thiel, 2014). Secondly, the factors being examined rely considerably on the perceptions of individual engaged stakeholders, which can lead to biases.

4. The Case of the Estonian Employment Register

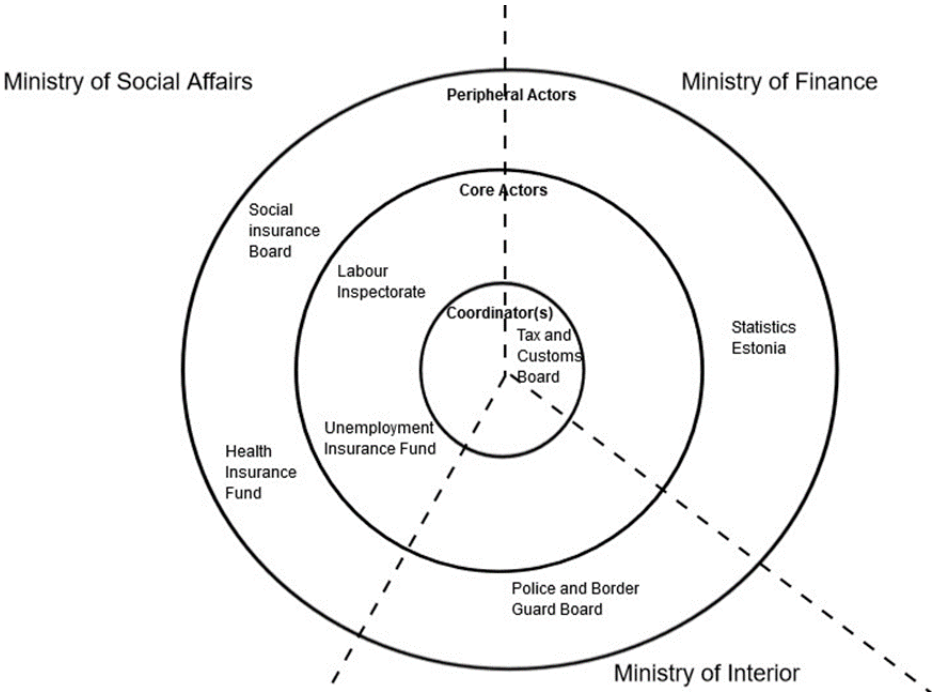
The Estonian Employment Register was originally introduced in 2014, and the initiative has been headed since its inception by the Estonian Tax and Customs Board (ETCB). The employment data of individuals is submitted to the register after entering an employment relationship, which is used as a basis for determining the obligations and eligibility for different benefits (i.e. unemployment benefits, health insurance). Over the years, there have been problems with many unaccounted wages, leading to reduced tax revenue, lack of social safety nets and abuse of employee rights. The improvement of control and supervision measures on tax discipline had been on the ETCB agenda following its formation in 2004. For 2013-2016, reducing the share of the shadow economy to remove unfair competitive advantages became one of the main goals[3]. To achieve this, the ETCB started several initiatives, including the Employment Register.

3 This goal was formulated in the ETCB's development plan and highlighted by the Minister of Finance and Director General of the ETCB.

Whilst the Employment Register began as a simple sector-based solution intended to meet the goals highlighted above, it transitioned into a comprehensive register incorporating all the employment data into a single electronic environment over time. The above was the result of the stakeholders' perceived opportunity for improvement in handling employment data and a broader movement towards adopting the once-only principle. An overview of the involved stakeholders is highlighted in Figure 2.

Figure 2:

Actors according to importance within the collaborative arrangement and ministerial governance



Source: Author's own, based on interviews, 2024

The Employment Register revolved around key actors mandated to operate with employment data to conduct different processes. These processes entail receiving tax income and monitoring correct tax discipline (ETCB), monitoring the eligibility and providing unemployment services and benefits (Unemployment Insurance Fund), monitoring safe working conditions, status and rights for employees (Labour Inspectorate, Police and Border Guard Board), monitoring the eligibility for health insurance (Health Insurance Fund), the eligibility for pension (Social Insurance Board) and conducting analyses on employment data (Statistics Estonia).

The following subsections outline the research findings according to the analytical framework of the system context, collaborative process challenges and management interventions. They are structured to highlight the findings that were the most predominant regarding the occurrence and co-occurrence of codes.

4.1. System context in Estonia and the role of digital innovation

System context was referred to 78 times, with the most frequent codes being efficiency (14 times), collaboration history/pre-existing network (11), and starting capacity (nine). The co-occurrence between high importance and system context highlighted collaboration history/pre-existing network (three), efficiency (two), and starting capacity (one). The co-occurrences of low importance occurred in the culture and features of the public administration system (one).

The findings indicate the relevance of several system context factors - the Estonian administrative system, technological infrastructure and employment as a policy field. On a central government level, Estonia operates a decentralised administrative system, where ministries are predominantly focused on policy formulation, resulting in reliance on executive agencies for administrative and professional input (Sarapuu, 2011; Sarapuu, 2012), leading to digitally capable agencies being the initiators for bottom-up developments with limited steering from ministerial level (Kattel & Mergel, 2018). The decentralisation has enabled reform-oriented agencies to develop technological capability, exhibiting the ability to introduce radical technological solutions and recognise new opportunities due to a strong starting capacity (Lember et al., 2018).

Regarding digital innovation, Estonia has retained a highly reform-oriented public sector throughout the past decades, with digital by default often being the norm for initiatives due to the potential for improved quality and efficiency (Kattel & Mergel, 2018). Focus on digitalisation is enabled by the high level of trust towards digital solutions (Lember et al., 2018). The underlying digital infrastructure with decentralised registries, X-Road infrastructure to connect various registries, electronic identification (eID), and state portals are the core building blocks for any digital developments and their expansion. The X-road provides the interoperability platform for existing decentralised databases and a data exchange layer that can be used by both public and private actors (Kattel & Mergel, 2018).

The collaboration history with the Employment Register initiative centred around the trilateral connections between the ETCB, the Estonian Unemployment Insurance Fund (EUIF) and the Labour Inspectorate. The collaborative supervision of employment activities facilitated informal connections, improving the understanding of the needs of different actors (I3, I4, I6). The mounting pressure to improve employment data collection for the trilateral collaboration led to a concerted interest towards change (I1, I2, I3, I4). Unaccounted labour led to inefficiencies in tax revenue, competition, and supervising activities (I1, I2, I4). As a result of the mutual

acknowledgement of the issues within the field of employment and the capacities present, the system context was conducive to change.

4.2 Process dynamics and challenges within the Employment Register initiative

Collaborative process challenges were highlighted 139 times, with the most prevalent codes being Insufficient/unsustainable resources/capacities (21), divergent goals/interests/personalities (16), and legal framework/red tape (10). The co-occurrence with high importance occurred with Insufficient trust/acceptance (four); communication (three); insufficient/unsustainable resources/capacities (two); divergent goals/interests/personalities (two); insufficient interest/incentive (two); legal framework/red tape (two); unclear goals/lack of direction (one) and coordination capacity (one). The co-occurrence with low importance occurred with insufficient/unsustainable resources/capacities (three); divergent goals/interests/personalities (two); insufficient acceptance/trust (one); insufficient interest/incentive (one); unclear goals/ lack of collaboration (one); timing (one); political opposition (one).

The primary challenges within the collaborative arrangement highlighted different strategic and institutional complexities and risks. First, the perceptions of the engaged organisations varied due to institutional-level differences in employment relationship supervision and health insurance, leading to divergent interests (I1, I3, I4, I5, I6). The ability to make retroactive changes to employment data entails a subtle but key difference within the policy fields, leading to legal challenges. One stakeholder summarised:

> *"The logic of the Employment Register is such that an individual submits an entry and can afterwards cancel it (…) The insured individual register doesn't delete anything (implying the inability to make retroactive change) (…) That is the main contradiction" (I6)*

The challenges were also reflected in power imbalances, with limited resources and capacities incentivising bartering and strategic behaviour for some actors (I1, I2, I3, I4, I6). The ETCB maintained the leading and coordinating role, possessing monopoly over the technical development and communication as well as considerable resources for development (I1, I2, I3, I4, I5, I6). Imbalances were further amplified during stakeholder activation with order of engagement based on relevance and perceived commitment, leading to advantages from early access (I1, I2). The perceived commitment was evaluated by the ETCB, relying on previous contacts in connection with employment data (I1, I3). Lastly, the decentralised nature of resource provision for digital innovation resulted that all continued developments were determined by individual interests, with peripheral actors possessing less resources for change (I4). One interviewee highlighted:

> *"It always came down to who has the funds in their budget and to what extent they could utilise them" (I4)*

An additional challenge originated from the overlapping jurisdictions between agencies (I1, I3, I5). The legal framework created overlapping jurisdictions with the right to access and operate employment datasets, which led to dependencies for the new register (I1, I3, I5), which was most prominent in the case of the contradictory logic with the use of employment data between EHIF and ETCB highlighted above, which provided peripheral stakeholders with an instrument to voice their feedback. An actor commented:

> *"Our (EHIF) position of strength is that they (ETCB) are legally mandated to submit data" (I5)*

The risks were connected to perceived reputation loss. Any error with employment data exchange for service provision entailed reputation loss for the organisations responsible (I4, I5, I6), resulting in concerns about relinquishing control over key processes. The findings on collaborative process challenges reflected primarily strategic level challenges (strategic, institutional complexity and power imbalances), with substantive issues regarding problem and solution formulation being perceived as a limited challenge. The challenges also reflect a combination of tensions originated from the system context (i.e. organisation-centric approaches based on legal frameworks), but also developed during the collaborative process (i.e. stakeholder activation providing advantages to core actors).

4.3 Management Interventions

The collaborative arrangement successfully utilized various intervention measures to adapt to the system context and challenges. Management measure related codes were highlighted 356 times, with the most prominent: clear goals (19), commitment to the collaboration (17), negotiation (14), outreach (13), formal procedures and rules of the collaboration (13). The co-occurrence with high importance occurred with clear goals (four); use of hierarchy (three); commitment to the collaboration (three); governance structure (two); informal rules/networks (two); personnel (two); clear responsibilities (two); stepwise approach (two); decentralised coordination (one); exclusiveness (one); trust building (one); negotiation (one). The interviewees didn't link any management measures to low importance. The research findings indicate a strong reliance on institutional design and leadership to successfully resolve the tensions arising from the context and problems.

The formal project organisation followed a standard structure with two levels - the steering committee for the strategic level and the working groups for the operative level, which was complemented by the functional leader and project manager, who coordinated the working group's activities. The steering committee consisted of top-level management from the included actors. Working groups were responsible for the substantive aspect of the collaborative process and were divided according to different topics, i.e. the legal framework and business rules (I1, I2). The steering committee monitored the progress of the working group, which received updates on the

developments. Some of the individuals (i.e. representatives of the Labour Inspectorate and Unemployment Insurance Fund) possessed dual roles, being included in the activities of both the steering committee as well as the working groups (I3). This resulted in stronger interconnectedness between the levels (I3). The functional leader and project manager maintained the overall vision and goals with a strong mandate from administrative leadership (I1, I2, I3, I4). In conjunction with strong motivation, core actors shared leadership to compensate for each other's "blind spots" (I3, I4). Furthermore, the steering committee provided support and legitimacy from administrative leadership, who took ownership and were representatives in external outreach. A stakeholder highlighted:

> *"The Director General of the ETCB started arranging meetings with representative organisations (...) to explain the benefits, starting with the Estonian Employers' Confederation, Estonian Association of SMEs, Estonian Taxpayers Association, and then he ensured that all partners were represented in these meetings" (I3)*

Several formal instruments were utilised throughout the collaboration. The main instrument was the vision document, which detailed goals, task distribution, resource usage and timeframe (I1). Scheduled formal working group meetings and subsequent protocols were used to monitor the overall progress of the vision document (I1, I3, I4). Decision-making within the project was compromise-based (I1), reflected in the agreed-upon approach to start with an MVP and a roadmap, which detailed the plans for follow-up developments to ensure the buy-in of the included actors. The entry rules centred around limitations of timeframe, legal framework, relevance with employment data and the level of commitment (I1). Deviations from initial goals were tolerated only to a limited extent to mitigate risks and challenges from overexpansion. One interviewee mentioned:

> *"We had a defined scope and wanted to stick with it. Otherwise, it would have stalled (...)" (I1)*

The trilateral connection between the ETCB, EUIF, and Labour Inspectorate enabled the reliance on informal measures (I1, I3, I4). Informal meetings were used to comprehend the possible opportunities, solve problems and maintain a willingness to contribute (I1, I3, I4). The informal measures provided the agility needed for digital innovation, to address the pressures and mitigate perceived power imbalances, thereby highlighting the importance of individual commitment (I3). One interviewee emphasised:

> *"Some things were truly done based on enthusiasm (...) At the end of the day, we were asked who would do it, we volunteered and did it in 2 days" (I3)*

The ETCB primarily retained the leadership role throughout the project. Both transactional and facilitative roles were utilised. The transactional measures were reflected through the project manager position and their role in day-to-day

management, emphasising adherence to the timeframe and reminding actors of the agreed-upon obligations (I2). A facilitative role was used to convene stakeholders and mediate through a compromise-based approach. The ETCB utilised a catalyst role through informal brainstorming sessions to engage stakeholders and expand the cognitive framework. The ETCB perceived their limited competency in comprehending all the relevant processes linked to employment data. As a result, they called out to different relevant actors to highlight their perspectives on using employment data and to look for potential improvements. One interviewee highlighted:

> *"(...) We (ETCB) had to show more initiative, to call upon other actors, ask regarding their needs or drive attention to what are their needs" (I2)*

The management intervention measures highlighted a combination of formal and informal structural instruments and contingent leadership roles.

5. Discussion

The author identified several relevant factors shaping cross-organisational collaboration management using the analytical framework. The Employment Register case reflects several key insights into enablers that originated from the context of the starting system and were exhibited during the collaborative process. The key enablers exhibited were:

a) underlying digital infrastructure;
b) the trilateral pre-existing connection between ETCB, EUIF and Labour Inspectorate; and
c) the starting capacity and role of the ETCB.
d) The underlying digital infrastructure became relevant through three interconnected advantages:
e) Interoperability between different digital solutions and registries.
f) Acceptance from end-users due to high levels of trust.
g) High initial cognitive convergence of digital innovation from previous reforms.

Combining advantages from the underlying digital infrastructure led to a conducive environment for further expansion and limited technological challenges, which parallels existing research findings on Estonia with the digital infrastructure supporting a unique system of decentralised development (Kattel & Mergel, 2018). The unique conditions proved to be crucial at the start. The initial development period for the Employment Register was condensed to a short period (less than a year) to accommodate the political interest, which was possible due to the opportunity to use the existing digital building blocks (i.e. X-road for interoperability). In the long term, the previous experiences became enablers for the legitimacy of the roadmap, resulting in preparedness for some actors to benefit from the initial MVP and others from follow-

up developments. The confidence that actors possessed from past experiences provided the initiative with flexibility and slack that could be utilised for incremental development, reducing the pressure towards the ETCB to deliver the results immediately.

The trilateral connection between individuals from the ETCB, EUIF and Labour Inspectorate proved vital in initiating, maintaining and expanding the collaborative arrangement. The findings reflect an interesting dynamic of the advantage of informal connections but in a small state context (Randma-Liiv & Sarapuu, 2012). Informal connections bypass the interaction costs present in more rigid and formalised structures. Combined with the increased importance of the individual, it provided a flexible environment for individuals and organisations to participate and shift roles in the project, providing collaboration opportunities for engaging more minor actors. Furthermore, the pre-existing informal connections provided further options for bypassing interaction costs in converging cognitive frameworks to reduce complexity initially, highlighting the importance of finding a common framework of reference for conflict resolution (Klijn & Koppenjan, 2014). The role of pre-existing connections reflects the impact of external and system context conditions in the prevalence and impact of more informal management measures.

The capacity of the ETCB became crucial for a contingent approach in leadership roles. The unique conditions of executive agencies possessing technological capacities and being the initiators enabled them additional levers to ameliorate perceived imbalances and, hence, shift between asymmetric top-down control to symmetric collaborative decision-making. Other stakeholders recognised and accepted their shifting roles, which lessened potential tensions from the shift of roles. The balance of dominant leadership roles shifted according to stages:

a) at the initial stages, convening and catalyst roles to justify the arrangement and broaden available perspectives;
b) at later stages, the transactional role is to maintain focus and limit overextension.

Shifting between activities—induce cognitive convergence, evolve the digital solution past its initial goals, retain stability—the ETCB highlighted a balancing game between seemingly conflicting goals. This highlights the use of contingency and reflects the importance of shifting the balance of instruments to maintain positive feedback loops (Emerson et al., 2011). This proved critical in utilising management measures to reduce the tensions originating from the broader system context and developed during the collaborative process.

The key enablers possessed a role in shaping the initial success stories and creating certain impediments for the future. The dynamics of the system context broadened the choice of management instruments, altered the efficacy of implemented instruments, and shaped the challenges collaborative initiatives met. The previous successes were instrumental in framing the initiative as an incremental development. The ability of the

ETCB to provide contingent leadership and balance between seemingly conflicting roles relied on the authority from the starting capacity and the unique conducive environment for digital innovation, which reduced perceptions of imbalances and risks, which in turn maintained the motivation of stakeholders to stay involved long-term even in instances, where immediate benefits were limited. The agility from informal measures was contingent on existing collaboration history and the trilateral connection between core actors. However, for the follow-up development of the register, the decentralised environment became an impediment, with actors being constrained in resource commitment and organisation-centric perspectives.

The barriers present within the Employment Register originate from tensions within the system context and the choice of management interventions. The key barriers were:

1. differences in perspectives due to differences in interaction arenas;
2. organisation-centric approach to management interventions;
3. power imbalances from available resources, commitment and legal mandate.

The findings indicated a significant barrier in cognitive convergence within the public sector from differing interaction arenas. The differences in operational logic can result in deadlocks within collaborative arrangements. Prioritising information sources from familiar interaction arenas over peripheral sources can intensify the deadlocks. The overreliance on pre-existing connections limits the ability of engaged actors to comprehend and adjust to different perspectives outside familiar domains relating to bounded rationality in knowledge creation and the resultant "blind spots" that actors possess (Raadschelders & Whetsell, 2017; Peters, 2015). Knowledge creation remains limited within an established cognitive framework, lacking the overview of obstacles from cross-use of data to machine-to-machine interactions.

Alongside biases in knowledge creation, committing to cross-organisational initiatives with support and resources requires overcoming organisation-centric obstacles. Although the initiative had a cross-organisational impact, the funding and legal framework remained organisation-centric, representing a constant tension between the two levels reflecting incompatibilities of past public management reforms with modern digitalisation initiatives with agencification limiting complex digital solutions (Peters, 2015; Savi & Randma-Liiv, 2016; Kattel et al., 2019). The fragmentation fostered perceptions of organisation-centric ownership, limiting commitment to further development. The conflict between cross-organisational design and organisation-centric institutional framework limited the possibilities to capitalise on a solution, as stakeholders gave way to bartering for organisation-centric interests. As a result, follow-up developments to a cross-organisational solution became a primarily intra-organisational initiative based on the availability of resources, which was most perceived by peripheral actors, who offered potential avenues for new developments yet lacked the resources to commit resources comparable with the core actors.

Alongside organisation-centric biases, the variation in available resources, commitment, and overlapping legal mandates at the cross-organisational level resulted in further strains. The differences in resources and commitment can often lead to distortions and disturbances within interaction arenas (Emerson et al., 2011; Huxham, 2003; Klijn & Koppenjan, 2015). Through a choice of measures tailored towards the core actors and gradual activation of stakeholders, the peripheral actors experienced perceptions of exclusion, leading to concurrent positive cycles with the core actors and negative cycles with the peripheral actors. The inability to properly align perspectives erodes trust, creating aversion towards changes (Wegrich, 2019; Ansell & Gash, 2012), leading to differences in perceptions regarding power imbalances with the peripheral stakeholders experiencing it more acutely.

The results highlight the source of challenges from the interconnected dynamics between organisational and cross-organisational levels. The inability to perceive the relevant perspectives due to limited rationality resulted in tensions in subsequent cross-organisational interactions. The adversarial positions adopted in cross-organisational bartering inhibited the ability to perceive the relevance of different perspectives at an organisational level, as stakeholders became more oriented to safeguarding existing positions and available resources. The conflict between the two levels deepens with the proliferation of actors, where the risks of losing resources and position to a single owner are amplified. The study highlights how digital initiatives expand towards processes with overlapping legal jurisdictions, and the strategic and institutional complexity is amplified.

The current enablers and barriers reflect some of the key challenges for collaborative digital innovation: a) the ability to expand positive feedback cycles towards new and peripheral actors whilst limiting the negative cycles; b) the capability of all relevant stakeholders to design human interactions to support human-to-machine and machine-to-machine interactions during the expansion of the solution beyond its initial end-goal.

The reliance on pre-existing informal connections based on key individuals' contributions possesses certain limitations for expanding digital solutions in cross-organisational dimensions. Whilst the trilateral connection in the case of the Estonian Employment Register provided significant advantages throughout the initiative, it also limited the evolution of the solution to limited perspectives. The inability to fully integrate new peripheral stakeholders into the process resulted in comprehending conflicts at later stages. The limited interaction cost between the core actors impeded the potential of peripheral actors to shape the development process. Furthermore, whilst the challenges in bypassing organisation-centric perspectives were surpassed within the initial trilateral connections, it proved increasingly more difficult with peripheral actors for whom organisation-centric perspective became an instrument (i.e. formulation of obligations within the field of employment) for negotiating. The findings highlighted the difficulty of balancing the game that collaborative arrangements face in designing interaction arenas to placate both peripheral and sceptical core and committed actors.

The need to formalise to root out informational bottlenecks yet maintain flexibility through informality creates tensions in meeting stakeholders' expectations, which can lead to disillusionment from both sides. The lack of formal measures can exclude peripheral actors from key information, whilst overformalisation can stifle ad hoc opportunities. The effects are unique within small state contexts, where individual turnover leads to considerable changes in organisations' available capacities and competencies (Randma-Liiv & Sarapuu, 2019). This results in the design becoming more susceptible to tensions, with turnover resulting in previously viable interaction arenas becoming dysfunctional. In a temporal view, the possible issues are exacerbated as the dynamics between actors are subject to change - from the change of individual representatives to the shift in relevance of actors. The complexities of the informal and formal interaction measures are further magnified by the cross-organisational patterns established to communicate with human-to-machine and machine-to-machine interactions. Existing literature has highlighted the challenges from the heterogeneity of the technologies and practices adopted by individual actors on a cross-organisational level of data exchange (i.e. Chen & Lee, 2018). Data exchanged on a cross-organisational level becomes susceptible to interpretation, necessitating proper structures to ensure fluid interactions between registries and information systems and any follow-up digital innovations. Interpretations stem from the values and perspectives of individual stakeholders and their respective interaction arenas where they operate. On a cross-organisational level, actors rely upon a mutual frame of reference to ensure consensus in interpretation, involving the harmonisation of terminology on a semantic and technical level using standards and classifications. Furthermore, there is a need for compatibility between operational logic. Rules regarding the insertion, (retroactive) change, exchange, and deletion need to be harmonised to ensure no conflicts with the processes of different actors and arenas.

To conclude, this study possesses several values for implementing digital technologies. The study was conducted in an alternative administrative tradition to Anglo-American and Scandinavian systems that dominate the understanding in (digital) innovation literature. The paper highlights the role of system context in enabling and limiting stakeholders, enabling a better comprehension of the role of context in alternative settings, thus furthering the academic knowledge of digital innovation in different settings. Additionally, the paper furthers the knowledge of the impact of collaborative arrangement and different structural factors. Digital infrastructure and the encompassing human interactions can serve as a conducive or unfavourable environment for new initiatives, shaping the actors' willingness to commit resources.

Furthermore, this highlights the role of executive agencies as initiators and catalysts for digital innovation, adjusting value propositions beyond the initial planning. In particular, in less rigid and more lenient structures characteristic to smaller states, the individual possesses key importance, as their competency and connections affect their parent organisation's commitment. The ability to determine the needs and wants

of stakeholders, together with interpretation into formats for the technological solution, improves the capacity of other connected stakeholders. The paper also provides an insight into a temporal perspective by highlighting the evolution of a solution from its initial implementation to subsequent follow-ups, which has been limited so far in literature (for example, see Bailey & Barley, 2020). The temporal perspective highlights the dynamic nature of instruments, where instruments oriented to collaboration can vary in benefits at different stages and affect the capitalisation of digital innovations. Finally, this paper furthers our understanding of digital innovation within the public sector. Literature on collaboration and innovation tends to highlight predominating cross-sectoral initiatives, thus overshadowing the role of digitally capable executive agencies in driving initiatives.

6. Conclusion

Public sector organisations worldwide are facing pressures triggered by growing societal demands for personalised solutions in digital media alongside heightened turbulence. The increasing demand on public administrations requires new cross-organisational solutions that engage different stakeholders within the public sector. The paper explored the role of system context, process challenges and management interventions in the case of the Estonian Employment Register and the connections between these factors through the analysis of key enablers, barriers and future challenges.

The paper analysed factors affecting cross-organisational collaborative arrangements. The findings highlight the importance of system context in managing the cross-organisational collaboration. The empirical study illuminates how the existing digital infrastructure and a decentralised approach shaped the initial development and subsequent expansion of the Employment Register. The established connections between the core actors affected the dynamics within the collaborative arrangement, resulting in predominantly informal management intervention. The differences strongly influenced the challenges within the collaborative process in the engagement of peripheral and core actors and the dynamics between cross-organisational and organisational levels. After the initial solution was implemented, management instruments providing a successful start became an impediment to expansion. Management interventions relied predominantly on facilitative roles in the initial phases. However, transactional roles obtained importance at later stages, highlighting the relevance of the contingency approach, with the need to shift the balance of roles to meet challenges and maximise the potential of digital solutions. The second research question focused on the institutional and management-related enablers, barriers and challenges. The pre-existing informal connections affected the interaction arenas and readjustments to the collaborative arrangement. Leaders can mitigate asymmetries through their resources – from technological capacity to pre-established networks.

However, the differences in perspectives between core and peripheral actors can impede further developments. The ability to capitalise on the potential of collaborative digital initiatives relies on surpassing the overreliance on key individuals with pre-existing informal connections to maintain existing positive feedback cycles whilst addressing the existing negative cycles.

Additionally, the ability to perceive and capitalise on any potentialities depends on the capacity of all stakeholders to create supporting human interaction arenas to machine interactions through establishing mutual frames of reference between different interaction arenas of varying logic. The results highlighted how the more positive and stronger the pre-existing connections have been, the more critical stakeholders are towards using (over) formalised management measures. However, this can change to a negative impact with the introduction of additional members for whom previous management measures are suboptimal. Furthermore, the case study indicated how the perception of imbalances is linked to the perceived importance and position within the collaboration. Lastly, digitally capable agencies can use authority from their technological capability to address ICT-based and non-ICT-based collaborative process challenges.

As the current case study focused primarily on a broad approach to the connections between the different system contexts, process dynamics, and management intervention factors, it would be beneficial to analyse their co-occurrences individually. While the paper did cover it to a limited extent, the temporal dimension could be further analysed. Furthermore, the management measures were analysed, but new insight could be developed by comparatively studying the combination of different instruments present within digital innovation projects. Finally, this study has reflected the significant role of informal connections, which could use further study from a framework better adapted to small states context. The study of cross-organisational collaboration management for digital innovation is essential for analysing the factors affected in different policy fields, which helps improve the design of collaborative arrangements.

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