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Navigating AI Implementation in Local Government: Addressing Dilemmas by Fostering Mutuality and Meaningfulness

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Abstract
This study explores AI-enabled local public service provisioning, especially dilemmas of the mutual and meaningful development process. Theoretically, it builds on the current literature on AI implementation in the public sector and relates it to the theorisations of mutuality and meaningfulness. Empirically, it examines the experiences of public agents in a qualitative case study of chatbot development by the City of Oulu, Finland. The study concludes six factors that are constructed into three interconnected dilemma pairs to examine cross-cutting problematic decision-making scenarios and provide reconciliations through mutuality and meaningfulness.

Keywords Artificial intelligence · Public services · Mutuality · Meaningfulness

1 Introduction

This research is situated within the broader field of Artificial Intelligence (AI) governance, more specifically focusing on the implementation of AI technologies into public services (Bryson, 2018; Dignum, 2019; Floridi et al., 2018). Like any organisational change, the introduction of complex technologies can generate conflicting dilemmas for organisations and influence the meaning of work as employees engage with AI-driven changes. The uptake of new technologies requires organisations to build new rules, practices, processes, and technological tools to ensure that public service agencies' use of AI technologies aligns with its strategies, objectives, and public values; complies with legal requirements; and adheres to ethical AI principles (Mäntymäki et al., 2022). This often happens in an intricate social environment, in which organisations balance the risks and opportunities associated with AI implementation and the conflicting interests and values of stakeholders (Dwivedi et al., 2021; Sigfrids et al., 2023; Wirtz et al., 2019).

Although AI governance research has made significant progress, gaps remain, particularly regarding the understanding of the implementation dilemmas of AI at the organisational level within public agencies. Mergel et al. (2024) and Birkstedt et al. (2023) highlight the lack of systematic empirical evidence on what AI implementation looks like within government agencies. Much of the existing literature focuses on public perceptions of AI (de Sousa et al., 2019; Yigitcanlar et al., 2023), rather than on the socio-organisational changes that occur within local governments as they adopt AI. Furthermore, the majority of literature reviews AI implementation from technical aspects, such as data sources and analytical techniques (de Sousa et al., 2019; Floridi & Taddeo, 2016; Mikalef et al., 2021), the role of government as regulator (Rahwan, 2018; Bryson et al., 2017; Bryson, 2018), and policy and strategy formulator (Bryson, 2018; Bryson et al., 2017; Salo-Pöntinen & Saariluoma, 2022). While there has been attention to the ethical implications of AI in public governance, the discourse has largely focused on identifying high macro-level challenges, defining ethics, and developing principles (Jobin et al., 2019). Thus, missing the meso and micro level understanding of implementing AI in the public sector (Stix, 2021) and managing dilemmas such as trade-offs and power imbalances that may affect outcomes of AI use (Birkstedt et al., 2023; Bryson & Kime, 2011). These gaps are significant because they overlook

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how AI implementation processes are at a more granular, organisational level, where everyday dilemmas may shape the outcomes of the implementation.

In light of these literature gaps, we examine civil servants' experiences of emerging dilemmas with chatbot implementation in local public services. We use a dilemma approach (Hampden-Turner, 1990) to identify potential challenges that may obstruct the ethical implementation of AI. We define dilemmas as practical organisational issues that provoke tensions, and they can be eased through dilemma reconciliation. Reconciled dilemmas facilitate the organisation's survival and continuous development (Kuoppakangas, 2015, 2019a). Dilemmas allow the analysis and examination of situations where several options or cross-cutting factors are simultaneously present. The dilemma approach is therefore well suited to the study of technological transformations since the implementation of technology has to balance, among other things, between technological, economic, and social aspects.

To address the socio-organisational dilemmas, we utilise theories of meaningfulness and mutuality to examine how employees find purpose in AI-driven transformations and how public organisations can foster trust, shared responsibility, and inclusive decision-making in the implementation process (Yeoman, 2019; Thibaut & Kelley, 1959; Blau, 1964; Colin-Jones & Murthy, 2021; Mayer & Roche, 2021). Following Yeoman (2014, 2019) we emphasise the need for public organisations to create environments where ethical principles are foundational to the organisation's culture, structure, and operations guiding the AI implementation. These theories also emphasise the role of employee satisfaction and intrinsic motivation in contributing to the public good, particularly in adapting to new technologies (Bankins & Formosa, 2023; Demircioglu & Chen, 2019; Yeoman, 2019), supporting civil servants'psychological empowerment at work and a citizen-focused technology-supported approach (Giesbrecht et al., 2016; Spreitzer, 1995). This approach underscores the capacity of organisations and ecosystems for ethical organising through mediating institutions that bridge individual and societal goals by fostering relationships, communication, and shared values, factors that combine meaningfulness and mutuality (Yeoman, 2019), aspects often overlooked in AI research. Such organising must tap into the full range of human motivations, especially the need for meaning (Yeoman, 2014). By applying this lens, we aim to highlight dilemmas that balance technological efficiency with human-centred values, thus revealing aspects organisations should address to ensure that AI adoption enhances both operational effectiveness and social well-being. This can help guide public management and governance of AI-driven public service development.

In this study, we aim to broaden the understanding of AI implementation dilemmas by examining the experiences of public service professionals across various sectors and levels of administration in local government. The current study contributes to previous research that explores factors of AI development in European municipalities (e.g., Germany, Norway, Finland) (Mikalef et al., 2021) and the challenges faced by employees in adopting AI (Schaefer et al., 2021), by examining how mutuality and meaningfulness shape AI implementation, addressing socio-organisational dilemmas and providing insights into fostering ethical and sustainable AI adoption in public services. However, in contrast to survey-based research on AI and chatbot implementation (e.g., Mikalef et al., 2021; Aoki, 2020) or studies focused on individual specialisms within ICT (Mikalef et al., 2021; Schaefer et al., 2021), our goal is to offer a comprehensive, multidisciplinary perspective on the AI implementation process. We do this by providing new insights into AI implementation across various specialisms and administrative levels within a single case study. The empirical contribution features a dataset of City officials and their key stakeholders in the Oulubot chatbot implementation in Finland. The article seeks to answer the following question: *How do the dilemmas in AI implementation impact its mutuality and meaningfulness, and how can these principles facilitate AI implementation in local public services?*

The paper first reviews relevant research, focusing on AI deployment and the importance of mutuality and meaningfulness in stakeholder involvement. We then outline our methods, present the empirical analysis, and conclude with theoretical insights and lessons for public agencies implementing AI-enabled services.

2 Background

2.1 AI Use in the Public Service Context

Public organisations are increasingly utilising AI to improve public service performance, for example, to offer new services and service channels, improve efficiency, and reduce costs (Mikalef et al., 2021). AI has the potential to enhance service quality and effectiveness by increasing the magnitude, speed, and accuracy of information processing (Eggers et al., 2017; Wirtz & Müller, 2019). By analysing large data sets, AI can offer personalised, proactive services and foster more inclusive decision-making (Miller & Keiser, 2021; Veale & Brass, 2019). AI-powered chatbots and digital services improve accessibility and citizen engagement, reducing the need for in-person interactions (Androutsopoulou et al., 2019; van Noordt & Misuraca, 2022). Beyond its functional benefits, AI is presumed to support high-value work and decision-making (Eggers et al., 2017).

As a transformative technology, AI represents a 'frontier of computational advancements' that mimics human

intelligence to solve increasingly complex organisational and societal problems (Berente et al., 2021), making AI a moving target for public agencies and presenting both opportunities and governance challenges. Gregor and Benbasat (1999) see AI as the science and engineering of creating intelligent machines, particularly intelligent computer programs capable of tasks requiring human intelligence, such as reasoning, learning, and problem-solving. This involves not just the simulation of intelligence but also the formalisation of common-sense knowledge and reasoning. Unlike earlier digital solutions, AI introduces new governance aspects such as autonomy in decision-making, adaptability through machine learning, and the inherent complexity and opacity of AI systems, often referred to as its 'black box' nature (Mikalef & Gupta, 2021). Unlike traditional systems that rely on static programming, AI continuously evolves through the processes of analysing data, reasoning, and self-correction (Gillath et al., 2021; Mikalef & Gupta, 2021), raising concerns about transparency and accountability in decision-making. AI's ability to autonomously perform tasks introduces challenges related to bias (O'Neil, 2017), privacy (Elliott & Soifer, 2022; Oseni et al., 2021), and the potential for misuse (Brundage et al., 2018), as AI decisions may happen without direct human oversight. Additionally, AI's potential to automate complex cognitive tasks influences employment dynamics and societal structures (Zarifhonarvar, 2023).

These characteristics create tensions between AI's efficiency gains and the ethical imperatives of public governance, including transparency, accountability, and social justice (Floridi & Cowls, 2022). In the public sector, the primary goal is to serve the public interest by providing services that promote social welfare, justice, and the equitable distribution of resources (Kinder & Stenvall, 2024). Differing from private companies (for-profit, market-oriented) that seek economic value, the goal of government agencies is to create public value (Koskimies & Kinder, 2024). This distinction imposes additional challenges, such as the need to maintain legitimacy, manage diverse stakeholder expectations, and operate under heightened transparency (Boyne, 2002). As public-sector entities, municipalities are more engaged in socially oriented activities and face higher levels of risk, often requiring them to prioritise social legitimacy over operational efficiency, minimising costs and maximising profit margins (Greenwood & Hinings, 1996; Scott, 1995; Zucker, 1983). Boyne (2002) highlights that public sector organisations, funded by taxpayers, are accountable to both the public and government, operating under high transparency and regulatory oversight, often leading to slower decision-making due to the need to align with multiple stakeholders and public policies. In addition, public-sector organisations are deeply influenced by political forces, often reflecting the agendas of newly elected governments and facing the added challenge of securing external support from diverse stakeholders to maintain legitimacy (Frumkin & Galaskiewicz, 2004). Hence, public-sector AI adoption is often shaped by coercive, mimetic, and normative pressures such as national AI strategies, regulatory frameworks, and societal expectations (Kuoppakangas, 2015; DiMaggio & Powell, 1983). Organisations must navigate these pressures while ensuring that AI implementation remains responsive to local needs and reconciles operational efficiency with societal trust, fairness, and ethical responsibility.

2.2 Mutual and Meaningful AI Implementation

As noted, AI use creates complexities for public service providers differing from previous digital solutions. Hence, there is a need for new approaches to AI implementation that support technological advancements' alignment with ethical considerations, as well as the public sector goals outlined in Section 2.1 (see e.g., Kuoppakangas et al., 2019b; Yeoman & O'Hara, 2017; Yeoman, 2014). This study applies the synthesis of meaningfulness and mutuality (Yeoman, 2014) as a conceptual framework for understanding the governance of public AI adaptation, particularly in addressing the dilemmas that may arise during AI implementation in the public service context.

Mutuality fosters a cooperative organisational culture, where members have shared responsibility in meaning-making processes. This mutual approach equips individuals with the capabilities necessary to incorporate meaningfulness into practical reasoning, motivating them to engage actively in decision-making processes that align with their values and ethical considerations. We focus on mutuality here because technological transformations like AI implementation are complex challenges that transcend traditional organisational boundaries and require collaboration between a range of stakeholders from different sectors (public, private, and third sectors), disciplines, and governance structures (Barrett & Baum, 2017; Hickok, 2020; Minkkinen et al., 2023; Papagiannidis et al., 2023; Rossi, 2018; Watson, 2014). The sense of meaning experienced by these actors emerges within this context.

Yeoman (2014) and scholars like Rosso et al. (2010), Wong (2008), and Frankl (1984) argue that meaningful work meets a fundamental human need, aligning with deeper ethical and social values. Lips-Wiersma and Wright (2012) suggest that meaningful work is organised along two dimensions: belonging versus doing, and self-actualisation versus serving others. In the public sector, this balance encourages employees to connect their roles to a broader societal purpose, as seen in cases where AI helps improve public health or social welfare. By aligning individual contributions with community benefits, meaningfulness fosters personal growth and strengthens organisational capacity. It also acts

as a foundation for mutuality, where employees feel empowered through respectful relationships and collective goals (Kuoppakangas et al., 2019b; Yeoman & O'Hara, 2017). For instance, when civil servants are involved in AI training and decision-making processes, they are more likely to see AI as a tool that enhances both their roles and their ability to serve the public, creating a more committed and engaged workforce.

Meaningfulness can also be a factor in organisational motivation for AI adoption and its success. The researchers argue that perceived meaningfulness may enhance employees' work satisfaction, empowerment at work, and organisational readiness for the take-up of new technologies (Bankins & Formosa, 2023; Demircioglu & Chen, 2019; Kuoppakangas et al., 2019b) and intrinsic motivation in contributing to the public good (Yeoman, 2019). Meaningfulness is crucial for creating environments where employees find fulfilment and purpose, leading to greater openness to organisational changes, such as the adoption of AI technologies (Bailey et al., 2019; Bankins & Formosa, 2023). The willingness to experiment and infuse innovation into an organisation is tied to the prior developed capacity to innovate and learn, and this is influenced by the proclivities and cultural norms of the specific organisation and how the culture of innovation and learning is embraced (Mikalef et al., 2021; Schaefer et al., 2021). Hence, public sector organisations should aim to create workplaces and technologies that are found meaningful for employees' work (Yeoman, 2014), which is crucial for successful AI implementation. In AI projects, such as predictive analytics in healthcare, meaningfulness emerges when employees perceive AI as supporting their professional roles and enhancing public service outcomes. Research shows that meaningful work leads to better job performance, increased organisational commitment, and improved employee well-being (Michaelson et al., 2014). Conversely, non-meaningful work has detrimental effects on workers, such as reduced motivation and a sense of alienation (Bailey et al., 2018, 2019).

Sigfrids et al. (2023) note that to develop sensible governance models, we must also consider why and under what conditions AI is being implemented. This involves evaluating the meaningfulness of AI technologies. Whether we need the AI system to solve the identified problem and whether these AI solutions provide real value to individuals, organisations, and society at large (Koskimies & Kinder, 2024). However, the question of who defines this perceived meaningfulness extends beyond technology and into the organisational dynamics behind its implementation. Critical studies have examined who holds the legitimate power to determine perceived meaningfulness (Bailey et al., 2019; Lips-Wiersma & Morris, 2009). Traditionally, organisational values and purpose are shaped by leadership and HR in a top-down manner. Tourish (2019), Willmott (1993), and Bailey and Madden (2016) interpret this to mean that when organisations attempt to control employees' sense of meaningfulness from the top down, it may result in superficial acting as if work or solution were meaningful (Bailey et al., 2019, 483), rather than fostering a genuine perception of meaningfulness (Kuoppakangas et al., 2023). AI governance should therefore incorporate participatory mechanisms that empower stakeholders to co-define the meaningfulness of AI systems.

In addition to organisation-level collaboration, AI implementation in the public sector occurs in multi-stakeholder environments. Due to limited in-house AI expertise and research capacity, public agencies often rely on public–private partnerships, which introduce additional complexities in aligning distinct goals, funding structures, accountability frameworks, decision-making processes, and performance metrics (Mikhaylov et al., 2018; Wirtz et al., 2019). This creates governance clashes (Ulnicane et al., 2021), conflicting values and principles (Fjeld et al., 2020), and different reference sets of legislation and professional standards (Edwards & Veale, 2018), often with different sets of ethical dilemmas foregrounded (Roberts et al., 2020). Thus, AI initiatives often disturb existing hierarchies and power distributions and bring up questions about their meaningfulness and impact on different groups (Koniakou, 2023; Bietti, 2021), such as who benefits from AI systems (Dignum, 2019). Mutuality plays a critical role in AI governance by fostering equitable stakeholder relationships. Because of its role as a central issue in social life and social relations (e.gDabos & Rousseau, 2004; Graumann, 1995; Jordan, 1986; Yeoman, 2019), mutuality becomes crucial in addressing these conflicts by creating equitable, interdependent relationships that balance power dynamics and ensure that all stakeholders, including employees, citizens, and organisations, have a voice in meaning-making (Dignum, 2019; Edwards & Veale, 2018).

Mutuality fosters social exchange mechanisms that balance stakeholder interests, preventing dominant actors from dictating AI governance unilaterally (Blau, 1964; Thibaut & Kelley, 1959). This is particularly relevant in public-sector AI implementation, where transparency and democratic oversight are essential (Pasquale, 2015). Mutuality seeks to establish a psychological contract between developers and end users, ensuring that both parties have clear expectations regarding AI's role, capabilities, and impact on decision-making (Dabos & Rousseau, 2004; Isaksson et al., 2010). For instance, in healthcare AI applications, mutuality ensures that clinicians and developers co-design predictive analytics tools to support, rather than replace, medical expertise. This dynamic extends to workplace AI adoption, where employers may prioritise efficiency, while employees may fear job displacement. Mutuality helps balance these concerns by promoting shared objectives through mechanisms such as transparent AI deployment policies

and ongoing stakeholder dialogue (Guest & Peccei, 2001). Rooted in social exchange theory, mutuality mitigates power imbalances by ensuring that both parties rely on fair and reciprocal interactions to achieve mutually beneficial outcomes (Blau, 1964; Thibaut & Kelley, 1959). Without it, AI adoption risks favouring dominant actors, potentially leading to exploitation or inequitable governance structures. Graumann (1995) extends mutuality to dialogue, where mutual knowledge, perspective sharing, and shared control over outcomes which is particularly vital in AI governance, where the complexity and opacity of algorithmic systems can create disparities in understanding (Pasquale, 2015).

Ethical organising perspectives reinforce mutuality's role in AI by advocating for cooperation based on shared values rather than isolated self-interest (Yeoman, 2019). Similarly, the economics of mutuality shifts focus in the private sector from profit maximisation to holistic value creation (Colin-Jones & Murthy, 2021). This approach encourages AI-driven businesses to partner with public agencies to prioritise societal well-being, shared growth, and long-term sustainability over individual gain, fostering more ethical and equitable relationships within the AI ecosystem. Yeoman (2019) argues that mutuality is a development organising principle including values, principles, and practices, where individual and collective well-being is created by mutual dependence guided by meaningfulness. Mutuality and meaningfulness are meta values that share the fundamental values of autonomy, freedom, and dignity (Yeoman, 2014). Hence, rather than viewing mutuality and meaningfulness as separate constructs, they can be understood as interdependent principles that shape AI governance. Mutuality establishes the conditions for ethical AI implementation by fostering stakeholder engagement and shared governance, while meaningfulness ensures that AI adoption remains aligned with public service values and societal well-being. This integration is essential for addressing AI-related dilemmas.

2.3 Dilemma-Based Approach to AI Implementation

In this article, AI implementation is framed as a deliberate organisational change aimed at embedding AI technologies into daily operations rather than merely introducing them as standalone interventions (May et al., 2016). Thus, AI implementation involves not only the technological deployment of AI-based services but also their responsible integration to meet citizens' needs. This process extends beyond technical development to encompass strategic alignment with organisational objectives, restructuring of workflows, and change management efforts that prepare organisations for the experimentation, acceptance, and sustained use of AI innovations (Madan & Ashok, 2023; Mikalef et al., 2021). Hence, AI implementation itself can be a disruptive process. Technology innovations have a systemic nature that presents a future-oriented, systemic, multi-agent approach often resulting in new governance arrangements and organising across organisational boundaries (Barrett & Baum, 2017; Hickok, 2020; Hyytinen, 2017; Laitinen et al., 2018; Rossi, 2018; Watson, 2014). Thus AI-driven transformations are non-linear processes (Freeman, 1991) that often require organisations to embrace iterative learning, adaptive governance models, and cross-sectoral coordination to navigate uncertainties (Hyytinen, 2017; Laitinen et al., 2018).

In relation to the idea of a dilemma-based approach, the earlier sections illustrated the socio-organisational complexities in which AI implementation necessitates public service providers to accommodate competing demands. When these occur simultaneously, they form a dilemma pair that often becomes polarised at opposing ends of the continuum, necessitating reconciliation during AI implementation to ensure a responsible integration (Kuoppakangas, 2015). In organisational change management research, dilemmas can be seen as situations that arise when organisations must navigate competing yet equally important priorities (Bianchini, 1993; Hampden-Turner & Trompenaars, 2000; Trompenaars & Hampden-Turner, 2002), such as innovation versus stability, efficiency versus inclusivity, or centralisation versus decentralisation, requiring strategic reconciliation rather than simple resolution.

The dilemma reconciliation method, as discussed by Hampden-Turner (2009), emphasises a holistic approach of'and-with'rather than'either-or'decisions, acknowledging that contradictions are interdependent. This method is applied in organisational change management, where the goal is to balance competing values, such as cooperation and competition, recognising that a compromise may undermine both extremes (Bianchini, 1993; Hampden-Turner & Trompenaars, 2000; Trompenaars & Hampden-Turner, 2002). Drawing on the dilemma approach, we employ this framework to address the AI implementation challenges (see e.g., Hytti et al., 2015; Kangaslahti, 2007; Hampden-Turner, 2009).

2.4 Summary

In summary, meaningfulness refers to a multilevel construct (Lepisto & Pratt, 2017; Lysova et al., 2018) in which we interpret Kuoppakangas et al's. (2023) three key dimensions. First, service delivery, both tangible and intangible, significantly impacts clients'lives and their ability to act as citizens. Second, meaningful work aligns personal identity with professional roles, while third, well-being arises from pride in service delivery, particularly in how AI can improve the service quality. Mutuality involves fostering equitable and interdependent relationships among stakeholders, where shared goals and commitments shape governance, encourage

cooperation, and balance power dynamics in multi-agent, multidisciplinary settings.

This study links mutuality and meaningfulness to dilemmas: conflicting but valuable alternatives that, while rational individually, seem contradictory when combined (Hampden-Turner, 2009; Bianchini, 1993; Hampden-Turner & Trompenaars, 2000). The dilemma approach aligns with mutuality and meaningfulness by providing a structured way to navigate the competing demands inherent in AI implementation in public service. Mutuality plays a central role in resolving these dilemmas by fostering collaboration across stakeholders, ensuring shared decision-making, and balancing power dynamics. Meaningfulness, in turn, ensures that AI adoption aligns with ethical and societal values, preventing governance decisions from being driven solely by efficiency or technological determinism (Yeoman, 2014). By embedding mutuality and meaningfulness into AI governance, the dilemma approach strengthens the theoretical foundation of AI-related paradoxes in public service, offering a framework for ethical, inclusive, and strategically aligned AI implementation that helps guide public management.

3 Method

3.1 Context of the Empirical Study: OuluBot Chatbot Implementation

Fina et al. (2021) highlight that Finnish local governments bear greater public service responsibilities than many European counterparts. Oulu was selected for this study due to its strategic focus on digital development and history of technological innovation, influenced by Nokia. This study focuses on OuluBot chatbot development. OuluBot was launched in early 2020 and has been in production since 2022 and continues to evolve. It was initially piloted in public transportation before expanding to a broad range of municipal services, including public transport, lost travel cards, tourism, library services, building control, and welfare services.

Chatbots mimic human conversations through text or voice interactions, acting as virtual assistants for users (Aoki, 2020; Luo et al., 2019). They integrate multiple AI technologies, such as natural language processing (NLP), machine learning (ML), large language models (LLM), generative AI, and data mining to enhance their ability to assist users (Androutsopoulou et al., 2019). In local government settings, chatbots improve service accessibility by providing 24/7 assistance, automating inquiries, and potentially reducing costs. OuluBot operates across multiple devices and platforms, offering multilingual support and accommodating local dialects, colloquial expressions, and office terminology. The chatbot sources information from municipal websites, chat histories, databases, and other datasets, using machine learning to refine its responses over time.

As a pioneer in municipal digital transformation, OuluBot exemplifies AI's potential while reflecting sector-specific challenges. Beyond local impact, OuluBot is part of Finland's Aurora AI program, which advances AI-driven public services through multi-stakeholder ecosystems. Positioned within Oulu's broader digital strategy, the chatbot is more than a technical tool; it redefines how public services are delivered by handling complex interactions, learning from user data, and continuously improving.

Two key aspects set OuluBot apart from other ICT projects in Oulu: 1) The steep learning curve of AI's "black box" nature, which challenges public agents' understanding across different administrative areas and 2) the management of the project, which involved training dozens of experts to develop chatbot content and support AI implementation across the organisation. The project required coordinated collaboration among professionals from central administration, well-being services, education, cultural services, business growth, and digitalisation units. Approximately 45 individuals contributed to chatbot training and content creation, alongside 5–7 experts from technology providers.

This study examines its implementation, structured into four phases: i) planning and design, ii) development, iii) deployment, and iv) operation and monitoring (De Silva & Alahakoon, 2022; Mäntymäki et al., 2022; Ng et al., 2022; OECD, 2019). The research focuses on the deployment phase, where the chatbot was integrated into public services on a limited scale before broader organisational adoption.

3.2 Methodology

3.2.1 Research Design

This study employs a qualitative case study approach to investigate AI dilemmas in local government, aligning with established qualitative methodologies that explore complex socio-organisational phenomena (Yin, 2015). Our focus is on understanding the mechanisms through which dilemmas manifest and are navigated. Following Easterby-Smith et al. (1991) and Eriksson and Kovalainen (2015), qualitative research offers us an opportunity to delve into meanings from data relating to the interplay between the human (City staff) and technological (OuluBot enabled by AI) elements of technological development in the public sector, and how it takes place. We utilise the coding process from Constructivist Grounded Theory (Charmaz, 2006) to explore the interaction between the agency (public service experts) and the structure (context and processes of AI implementation) and to study the underlying unobservable mechanisms influencing mutuality and meaningfulness. Allowing us to explore not just what participants experience but also why these

AI dilemmas arise in public service contexts. While this study adopts CGT as a methodological approach (Charmaz, 2006), our epistemological stance has critical realist underpinnings (Bhaskar, 1975). Unlike traditional CGT, which relies on pure induction, we employ abductive reasoning to iteratively refine emerging concepts, ensuring that mutuality and meaningfulness are theoretically informed rather than solely emergent. We believe that our empirical research will shed light on the dilemmas surrounding AI implementation in public service providers and offer critical insights into the associated challenges.

3.2.2 Sample and Data Gathering

The sample of our empirical research presents a case study due to its strengths in allowing us to identify and acknowledge different views and connections between constantly changing and complex environments (Yin, 2015). As Dubois and Gadde (2002) and Gustafsson (2017) argue, the single case study is especially suitable for those phenomena (such as mutuality and meaningfulness) that are less amenable to more superficial measures and tests, for example, normative and ethical dilemmas and experiences of the AI development process. This study aims to understand the connections and experiences to provide a nuanced, empirically rich, and holistic account of mutuality and meaningfulness in the AI implementation process.

The sample selection was conducted by purposive sampling (Etikan et al., 2016) to find people involved in the OuluBot development project to comment/narrate on AI development and thereby support answering our research question. To protect the informants' anonymity, details such as specific titles and the gender of the informants are not provided. Due to the multidisciplinary nature of the OuluBot project, personnel with different professions from different sectors and levels of administration are presented in the data. Overall, 18 people were interviewed in June 2021 (Table 1). This includes eight individual interviews that were complemented with four focus group interviews of 2–3 people. The interviews lasted approximately 60–90 min each. Interviewees gave written consent and their anonymity was guaranteed. All interviews were conducted in Finnish and subsequently fully transcribed afterwards.

We were interested in the organisational agents' experiences of AI development. Consequently, we did not concentrate on understanding the service users' experiences. For these reasons, municipal citizens were not interviewed for this study.

To understand the development process and its socio-organisational aspects, we used thematic interviews with open-ended questions to allow informants to speak freely and define the terminology (Charmaz, 2006; Silverman, 2011). Allowing informants to choose the terminology and sequencing could make internal validity problematic, but we carefully coded and triangulated the findings to seek meanings and not rely on word matching. Because of the challenges of AI as a topic, we gave the informants time to prepare for the interview by sending the questionnaire in

Table 1 Interviews, code, position, organisation, and description

Interview	Code	Position	Organisation	Description
Individual	I- 1	Manager	City of Oulu	Municipality, the public agency responsible for public service provision in the City of Oulu. Oulu Digi is a public utility responsible for coordinating the digitalisation of services and ICT solutions Informants were from different departments e.g., central government, communications, education and culture, Oulu Digi, and well-being
	I- 2	Manager	City of Oulu	
	I- 3	Manager	City of Oulu	
	I- 4	Head of a department	City of Oulu	
	I- 5	Head of a department	City Of Oulu	
	I- 6	Expert	City of Oulu	
	I- 7	Manager	City of Oulu	
	I- 8	Expert	City of Oulu	
Group 1	I- 9	Project head	City of Oulu	
	I- 10	Chief	City of Oulu	
	I- 11	Designer	City of Oulu	
Group 2	I- 12	Coordinator	City of Oulu	
	I- 13	Head of a department	Service provider	Non-profit municipality-owned concern that provides financial and HR services and support services to municipalities
	I- 14	Coordinator	City of Oulu	See above
Group 3	I- 15	Head of a department	City of Oulu	
	I- 16	Expert	City of Oulu	
Group 4	I- 17	Head of a department	Development organisation	City's support for business and industry growth
	I- 18	Head of a department	Development organisation	

advance. To address the research aim of exploring dilemmas in AI implementation and how mutuality and meaningfulness can guide AI development, the five themes were chosen to cover the key aspects of the development process. These themes enable a holistic understanding of the challenges, cooperation, frameworks, and ethical considerations involved in AI implementation. In total, the questionnaire had 11 questions divided into five themes: 1) problem framing to help identify challenges in the development phase and find solutions and map out the role of the technology (e.g. What does OuluBot solve now and in the future? What kind of challenges have you had in the development process and how have you sought to solve these challenges?), 2) cross-sectoral cooperation to understand the building, organisation, and management of ecosystems and mutuality (e.g. How has OuluBot functioned as part of the service system? How is cross-sectoral or organisational cooperation governed and led?), 3) development frameworks to recognise starting points for development (e.g. What kind of frameworks or ways of thinking have steered OuluBot development?), 4) staff and customer involvement in customer value creation (e.g. How have customers and personnel participated in the OuluBot development? Were you able to sufficiently utilise the competences of personnel from different fields? If so, how was that managed?), and 5) service development practices and ethics to identify problems encountered and foresight (e.g. Have you identified some ethical issues? If so, what were they and how have you managed them?). Meaningfulness cuts through all these themes.

3.2.3 Analysis

In the content analysis (Kondracki & Wellman, 2002; Silverman, 2011), our coding process in Atlas.ti proceeded in stages: (1) generating 145 initial codes through line-by-line analysis based on single descriptions of organisational AI implementation dilemmas, (2) clustering these into six focused codes by identifying thematic similarities in the challenges described by participants, particularly those related to decision-making structures, governance tensions, and organisational learning, (3) organising focused codes into three dilemma pairs through abductive reasoning by systematically comparing them to AI implementation challenges identified in the AI governance literature, (4) refining the dilemmas and identifying enablers and inhibitors of mutual and meaningful implementation by comparing them with the theoretical framework. For example, aspects related to leadership practices frequently co-occurred in discussions about AI implementation decision-making structures, indicating a tension between top-down and bottom-up management approaches. This led to the formation of the dilemma pair 'managing top-down vs. managing bottom-up'. The data provided reconciliations and activities that either supported or acted as a barrier to AI implementation which are addressed in the findings.

The process of constructing dilemma pairs was not arbitrary but driven by iterative comparisons between data and existing AI governance research. While alternative combinations of focused codes were considered, the selected pairs best captured the recurring dilemmas. The coding process left us with six focused codes to build our theoretical contribution: 1) Way of thinking and development goals, 2) Participation and commitment, 3) From project to practice, 4) Learning in practice, 5) Leadership and governance, and 6) Social cooperation (Table 2). The constructivist approach supports the emergence of different phenomena in the data while considering the interpretive frameworks, biographies, and interests as well as the research context. For an in-depth exploration of coding in CGT, the reader can refer to Charmaz (2006).

The codes were constructed into themes which were labelled as the three dilemma pairs of this study: 1) Setting aims for AI technology vs detecting customer needs; 2) Learning from practice vs. short-term project constraints, and 3) Managing top-down vs managing bottom-up (see Kuoppakangas, 2015; Silverman, 2011). Through content analysis, it was detected that in AI implementation, closely connected extreme organisational dynamics existed that guided implementation and influenced meaningfulness and mutuality, which were organised into the themes of the three dilemma pairs (see also Kuoppakangas, 2015). During the final phase of theoretical coding, we systematically related the findings to the existing literature on AI governance, organisational change, and dilemma reconciliation to validate our interpretations. The coding process was first conducted independently by Author 1 and then repeated by Author 2 to ensure validity and reliability. Any interpretational differences in the analysis were discussed between the researchers to resolve discrepancies and arrive at the most reliable interpretation. The findings of the analysis are presented next.

4 Empirical Results: Case OuluBot – Organising Expert Services for Residents

The study identified key activities by the case organisation to implement AI in public services and uncovered three interconnected, overlapping dilemma pairs (see also Kuoppakangas 2019a, b) that require reconciliation for effective and meaningful AI implementation.

The findings are presented in line with the six data analysis focus codes. Moreover, the data collection's focus codes are further reconstructed into three interconnected and somewhat overlapping dilemma pairs (see also Kuoppakangas 2019a, b). According to the empirical data, the development

Table 2 Data structure in the CGT

Theoretical sampling	Opposite dynamics needing reconciliation	Identify and develop the key categories to form the core concepts	Label segments of data—such as words, lines, or incidents—with a code that concisely captures their core meaning
Emergent theme	Dilemma pair	Focused code	Initial code (examples)
Observed organisational dynamics influencing mutual and meaningful AI implementation	1. Setting the framework and aim for AI technology vs. detecting customer needs	Way of thinking and development goals	Customer centricity and building customer understanding; Human centricity; Need-based reasoning; Organisation centricity; Goal setting practices; Limitations of technology
		Participation and commitment	Participation of civil servants; Role of technology provider; Customer engagement; Communication of OuluBot; Opportunities to influence; Early engagement; Commitment to AI implementation
	2. Learning from Practice vs. short-term project constraints	From project to practice	Limited human resources; Limited financial resources; Funding structures; Project model challenges; Short time period; Embedding practices; Project management practices
		Learning in practice	Learning from previous implementation experiences; Customer learning; AI literacy; Silent knowledge transfer; Developing learning from others; Learning on the job; Learning from/of AI; Skills gaps
	3. Managing top-down vs. managing bottom-up encountered	Leadership and governance	Top-down governance, Existing hierarchies; Missing understanding of the field in high management; Meaning of leadership; Description of leadership challenge; Change management; Experience of successful leadership; Multidisciplinary leadership; High-level governance; Incentives
		Social cooperation	Silos hindering the cross-sectoral operations; The organisation's structures support silos; Support from colleagues is important; Culture of cooperation; Confusion on roles; Structures of stakeholder cooperation; Sectoral silos; Dialogue and interaction; Common language; Collaboration between administrative branches; Meaning in collaboration; Collaboration with technology provider

stage of AI technology was moving forward moderately well in practice, but obstacles were found. The findings show the dynamics between the three mapped dilemma pairs consisting of the detected within the interplay of the human (public service professionals) and technological (chatbot enabled by AI) elements of technological development in the public sector. In addition, possible reconciliations are provided, which may have balancing effects for the dilemma pairs.

4.1 Dilemma Pair 1: Setting the Framework and Aim for AI Technology vs Detecting Customer Needs

Initially, the expected role of the new technology appeared somewhat unclear, according to informants. While its purpose was still being defined, it was observed to influence the AI development process, affecting both mutuality and meaningfulness in different ways. Mutuality was influenced by the lack of cross-departmental alignment and stakeholder participation in setting AI goals, while meaningfulness was affected by the unclear purpose of the technology and its perceived impact on public services.

When inspecting the focus code *'way of thinking and constructing development goals'*, interviewees described a range of over 20 different aims for AI use. These included customer guidance, first contact-point services, improvement of customers' everyday life, meeting the City's strategic aims, boosting the municipality's vitality, a communication tool for citizens, expenditure savings, quality control of operations, multichannel service provision, customer information services, quality control of services, enhancing the availability of services, enhancing the effectiveness of services and resources, internal utilisation, technical solutions to unify operations, data processing, and other general aims.

To clarify the dilemma, we observed that while AI was expected to enhance customer service, its actual use was shaped by organisational priorities that did not always align with customer needs.

> We might not even know everything […] I would see it [OuluBot] as this whole which can be used to handle I guess the most common questions, customer guidance, things, services […] that handles the first customer contact. (Group 3: I- 15; I- 16)
> It [OuluBot] is a digital solution for single contact-point services […]. In the future, it will serve the customer as much as possible. (Group 1: I- 9; I- 10; I- 11)

This ambiguity in defining AI's purpose created tensions between the broader strategic aims of the City of Oulu and the practical needs of users. There were ideas about how OuluBot could enhance the functioning of the city and improve service provisioning, but a clear consensus on the practical application of the technology was still developing, with different agents holding varying perspectives on its meaning. From this, it can be argued that unclear aims for technology use can be inhibiting for both mutuality and meaningfulness. A lack of mutuality emerged from the absence of shared agreement among stakeholders on AI's purpose, whereas a lack of meaningfulness was observed in the disconnect between AI's potential impact and its actual implementation. This can result in vague aims that challenge practical organisation and resource allocation and can cause the project to expand from its scope. However, the agents identified that the intended use or frame became clearer during the development process as learning in practice happened.

> When we began this [OuluBot project], we didn't know what we wanted or how to get this done. We had this specific frame or dream image and now this has begun to develop from it [the dream image]. (Group 2: I- 12; I- 13; I- 14)

Informants also argued that the ways of thinking presented by individuals or groups influence the setting of goals for technology. A key distinction emerged between two orientations: if the focus was on the phenomenon, organisation, or sector of administration, the aims were primarily internal, such as internal utilisation of AI, or technical solutions to unify operations. Phenomena and organisation orientation were seen as inhibitors for development as they sustain cross-sectoral cooperation and human-centred approaches to problem-solving.

Here the results of focus code *'participation and commitment'* come into play. According to the empirical data, the cross-sectional inclusion of staff had taken place during the development work, and it was found to be an enabler in mutual AI development. The room for improvement was identified in genuine co-creation activities. Lack of them reduces the sense of shared ownership and weakens both the alignment of AI with citizen needs (meaningfulness) and the collaboration necessary for success (mutuality).

Many informants agreed that there is a lot of potential and capability in the City's staff, but systemic barriers prevented their voices from being fully incorporated into decision-making processes. This limited mutuality by excluding key stakeholders from shaping AI development, and it inhibited meaningfulness by disconnecting AI from the practical challenges faced by employees and citizens.

> We have great potential in our staff but who takes it into consideration? […] the problem is how do we take these development ideas really into consideration. […] how do you get the people behind the idea? (Group 1: I- 9; I- 10, I- 11)

The city has supported mutual development by organising platforms for participation that are open to anyone working

at the City of Oulu, and were identified to be helpful and useful by the staff (Group 2: I- 12; I- 13; I- 14).

In addition to staff involvement, informants stressed the importance of including citizens in the AI development process to gain a genuine understanding of service needs. Some informants identified limited but existing customer involvement in the implementation.

> […] customers have been included and we do have these bot-whisperers there. (I- 4)
> We do consider and listen to all the feedback citizens have given to the City through different channels. If there are good suggestions, those stay somewhere and we think if we can implement them. (I- 1)

The informants explained how the customers had been included in the development process when the piloting of the OuluBot online chat took place, and the chat history was used in the OuluBot development. Customers could try out the chat with their questions and receive answers. Customer feedback was collected via the customer feedback channel. Informants mentioned that early-stage citizen engagement was limited, meaning citizens had fewer opportunities to actively influence the AI's purpose. Instead, participation was more passive, with citizens primarily involved as subjects of data collection. The informants did not mention the involvement of focus groups, third sectors, or councils in the process.

The lack of citizen participation could have an impact on the perceived transparency and accessibility of public services, the understanding of AI functionalities and its ethical implications.

> But the participation is a good question, have we taken citizens on board with this that much? Of course, when they respond to a chatbot, we save the data and use it for teaching. […] But I don't know if we have asked the citizens what they think. (I- 8)

The informants recognised the need for the setting of a mutually shared goal for AI development and the importance of impact evaluation to reconcile dilemma pair 1.

> The three most important; to begin with the goal we want to reach (with AI). And how the process is built and how we get an impact, especially in the lives of the citizen. (I- 5)
> It is the familiar cliché that we need shared goals. It might even be easy to define, but we also need key performance indicators to evaluate the benefits (of AI). (I- 2)

To summarise, it can be interpreted that mutuality in AI development faced challenges due to fragmented participation and limited coordination among stakeholders, while meaningfulness was affected by unclear user needs and ambiguous AI objectives. A customer-oriented approach could be strengthened by a shared common goal, mutual ways of thinking, and problem-framing that arise from the genuine participation of both customers and staff. However, informants noted that these elements are still in development and there were structures of collaboration in place supporting mutuality.

4.2 Dilemma Pair 2: Learning from Practice vs. Short-Term Project Constraints

The empirical data highlighted challenges in integrating AI development into organisational practices. When AI initiatives were driven primarily by institutional pressures and organizational needs, the meaningfulness of AI implementation suffered (*focus code 'from project to practice'*). In contrast, when AI development was guided by a needs-based approach, aligning with the real demands of employees and customers, it was more effectively embedded into the organisation's operations.

> Different steering groups should check that every project is based on a genuine need. We can do pilots and we can think that a permanent solution won't come out of this, but there should be some benefit to some party. (I- 1)

Public agents found it difficult to transition from AI pilots to long-term operational solutions, and informants worried that projects were not as beneficial as they were thought to be. Public agents struggled with translating pilot projects into sustainable AI-driven services, raising concerns that projects were not yielding their expected benefits. Many informants pondered about resource constraints, with insufficient time and personnel for AI development alongside daily responsibilities. This is particularly important because investing in AI and other emerging technologies incurs significant costs for municipalities. AI implementation in the public sector is resource-intensive, requiring substantial taxpayer funding and extensive workforce reskilling.

> Projects are put into practice quite badly because there is always a new thing to concentrate on. If you don't have the personnel to do the job after the project is over, then it is done. […] Often, we don't get the benefits from the project. Or if this is a reform that is not project-based, then it takes years before it will become functional in an organisation as big as ours. (I- 8)

The informants also discussed a possible reconciliation of dilemma pair 2 that might enable AI development to promote cross-sectional cooperation and enhance the project's results/development to become a permanent practice in the organization.

> Of course, in the beginning, we try to commit everyone to the process so that the person feels that they are needed during the journey and would be joining [the development process] […] This has not taken their decision-making power, it is the opposite, that here they can utilize what others have created […] and this point of view is a good start. (I- 1)

The importance of focus code *'learning in practice'* was discussed by the informants in AI development. It was found to enable the utilisation of AI technology in their everyday work, as learning together through the project enabled the change in the ways of working. Simultaneously involving customers in the learning process was mentioned as an important enabler in OuluBot AI development.

> We began from a bottom-up organisation structure, from customer service. We offer training and every employee can go through the training and contribute to OuluBot development either as a bot-whisperer or a content creator. We made this possible for all enthusiastic employees that we do have. (Group 1: I- 9; I- 10, I- 11)
> Then of course there is the learning of customers so that they find and learn how to use this bot. Learning does happen in other services also, but with the City of Oulu, they must learn how to use the bot. As they do that simultaneously, the bot is thought about as well. (Group 2: I- 12; I- 13; I- 14)

Learning in practice has also been challenging, as the chatbot has made adjustments that might differ from the ones developers would make.

> One thing that has surprised me is that when you work with an AI-based system and you get one part right or so you think, then the other part becomes broken because AI in the background reads the situation differently. […] I think it is this learning process with the AI – what kind of changes it makes and how they begin to function. (I- 6)

Furthermore, informants dwelled on the matter of not learning from past projects and how this would inhibit the dissemination of ongoing and new AI development projects in public services. I- 5 pondered on learning from previous pilots, "How much have we been able to learn and utilise the knowledge [from previous chatbots] for OuluBot?". Mutuality was enhanced when AI training programs enabled collaborative knowledge-building across staff, technical experts, and service users which Oulu succeeded in based on the informants. Meaningfulness increased when AI systems were continuously refined based on real-world learning and user feedback.

4.3 Dilemma Pair 3: Managing Top-Down vs Managing Bottom-up Encountered

The empirical findings in focus *'leadership and governance'* highlight both opportunities and challenges in leading AI implementation in public services. Informants emphasised that when AI projects were imposed through top-down mandates without sufficient engagement from frontline staff, they faced resistance and failed to integrate effectively into operational practices.

> Of course, we have this one sector, where they assigned someone to it [OuluBot] as someone's task so they tied people to it. But that didn't go anywhere. It started with the voluntary enthusiast participators. In a way, it has taken the wind under its wings so that we can create these competence centres. (I- 4)

The meaningfulness of AI implementation was reflected as one informant said "Many sector leaders feel that there are no benefits from this, that this is again "top management fluff". This indicates the disconnect between the strategic vision set by upper management and the practical realities faced by employees and customers. This perception may stem from AI features such as complex, opaque decision-making processes or the deployment of technology without clear, tangible benefits for those directly impacted.

The empirical data provided information on how cross-sectional cooperation was building the perceived meaningfulness of AI technology development. The informants commented on the public sector's organisational "silos" and the problems of cross-sectional cooperation, an inhibitor in mutual AI development. Hence, the OuluBot development created an ecosystem that was cutting through the silos and providing a platform for cross-sectional cooperation, which was also building shared understanding of AI's value and the perceived meaningfulness of AI technology among the staff and being an enabler of AI public service development. These results are also connected to the focus code '*social cooperation'*.

> Of course, when you look from the inside, there are challenges. […] The organisation structure supports the silo-like functioning more than the cross-sectoral […] It is important that you have the support of your colleagues and there is a culture of cooperation. (Group 4; I- 17; I- 18)

The informants discussed the importance of bottom-up approaches involving staff at the very beginning of development, ideally in co-creating the development ideas including the ethical aspects of AI. Bottom-up management of encountered and foresighted problems was mentioned as an important enabler of successful AI development in the City's service provision. When the staff was included voluntarily in the

development project, it also promoted a willingness for *social cooperation* and enabled the perceived mutuality and meaningfulness of the AI development. Informants experienced good opportunities for co-creation, meaning that mutuality was fostered through active collaboration and the exchange of ideas.

> And there has been a good open ground for co-creation. (Group 4; I- 17; I- 18)

Moreover, informants highlighted that AI is not just a technological tool but a governance and management issue.

> I strongly believe that the best innovations do not come from leaders. They might come specifically from the "grassroots" level. But it is still a management issue. Above all, the utilisation of new technology like this is a management issue. (Group 1: I- 9; I- 10, I- 11)

The informants discussed the importance of establishing a mutual language among all stakeholders in terms of the AI technology/OuluBot. Some described how it had come as a surprise how challenging it was to find a common language between technical developers, frontline service providers, and end-users. This was also affecting the perceived mutuality of the AI development, and it was evidently an inhibiting issue for learning, but this is reconcilable when all stakeholders are involved in the AI development and find a common language. Thus, building perceived mutuality and meaningfulness is a collective process when learning in practice (focus code 4).

> The only thing that I face is that the strong technical knowledge and customer servers don't speak the same language. […] When I ask a "bot-person" how I get to the bot, I don't understand the answer. (I- 3)

In addition to finding a common language with other people, the informants expressed concerns about AI's ability to understand human language diversity. AI-powered systems like chatbots must process spoken language, informal phrasing, and domain-specific vocabulary, which can hinder their effectiveness if not properly trained.

The informants dwelled on the enablers to reconcile dilemma pair 3, stressing the need for structured collaboration from the outset, ensuring that AI implementation aligns with organisational strategies, frontline expertise, and ethical considerations.

> I think that communication and shared understanding need to be established at the beginning [of the development project]. Things cannot just be created by one or two people. Or even so that we have one key agent from each sector to discuss the matter with the central government. The commitment must begin with the City's strategic goals. […] We need to begin with the content, and how it must flow in the process so that it is aligned with our strategy. (I- 8)

To summarise, the findings highlight some challenges associated with top-down leadership in AI development, with informants expressing concerns that it sometimes led to unclear communication and limited mutual engagement. When top-down leadership is disconnected from frontline realities, it can result in resistance and slower adoption, particularly due to AI's complex and opaque nature. In contrast, bottom-up involvement, where staff contribute early to AI design, ethical considerations, and practical applications, has been shown to encourage cooperation, trust, and a greater sense of AI's usefulness. While cross-sectoral collaboration remains a challenge due to organisational silos, it is even more crucial for AI, which depends on diverse data sources and interdisciplinary knowledge. Addressing communication gaps between AI developers, service staff, and end-users is essential for bridging technical and operational perspectives, ultimately enabling successful AI-driven public service innovations like OuluBot.

5 Discussion

In this qualitative study, we explore the dilemmas faced by public sector organisations during the implementation of Artificial Intelligence (AI) technologies, with a particular focus on local public services. The implementation of AI in organisations presents a multi-dimensional governance challenge, requiring the development of new rules, practices, and processes to ensure that public service agencies align AI usage with their strategies, objectives, and public values, simultaneously complying with legal requirements and upholding ethical AI principles (Mäntymäki et al., 2022). As noted, the understanding of AI implementation in local governments is limited and research is therefore relevant. Even though AI use in the public sector is increasing and promising in terms of efficiency, innovation, and citizen engagement (Mikalef et al., 2021; Wirtz & Müller, 2019), it is constrained by dilemmas between the established structures and practices of public organisations and the dynamic, experimental nature of AI technologies. Hence, limiting AI adoption in local government. By investigating an in-depth single case study of the implementation process, this study offers insights into the struggles and strategies employed by public organisations in integrating AI into their services. At the same time, this research demonstrates how insights from mutuality and meaningfulness literature can enhance our understanding of how public organisations manage these challenges in practice either by inhibiting or enabling the dilemma. By doing so, this study provides empirical insights into the organisational governance of AI adoption in the public sector and advances our understanding of AI implementation within public organisations, as we elaborate in this section.

Our study indicates several AI implementation governance dilemmas (Tables 3, 4 and 5) that emerge during AI

adoption, each of which influences the effectiveness, ethics, and outcomes of AI implementation. If reconciliations are not sought during the implementation, there is a risk of unethical outcomes. it is noteworthy that while finding reconciliation to one dilemma pair and its inhibitors, the reconciliation may simultaneously reconcile other dilemma pairs. In addition, reconciliations are not static in nature. Instead, they are constantly evolving, and they yield proactive recognition and mapping, so the reconciliation of one dilemma may also create unintended new dilemmas (Kuoppakangas et al., 2019a, b). First, the tension between 'Setting the framework and aim for AI technology vs detecting customer needs' highlights a previously underexplored structural issue in AI governance: the absence of a shared cognitive framework for problem-framing across different stakeholders. While previous research has recognised the influence of pressures (Mäntymäki et al., 2022), such as regulatory requirements, industry trends, and professional norms, on AI adoption in public services, this study highlights the importance of fostering mutual understanding among public officials, technology developers, and citizens. A shared vision for AI's purpose can help ensure that its implementation goes beyond internal efficiencies, such as streamlining operations or unifying technical systems, to truly address citizen needs and enhance public services (Mergel et al., 2019). This highlights that during the implementation AI development goals in the public sector can emerge reactively rather than proactively shaped by competing logics, such as efficiency, service accessibility, and political priorities. While Osborne et al. (2015) argue that service needs should not be framed solely by providers, this study shows how meaningful AI use is eroded when staff and citizens are only engaged in passive roles, such as data contributors, rather than active co-creators. This creates a paradox: public sector AI is meant to serve citizens, yet its aims are often defined in isolation from them.

The second dilemma pair 'Learning from practice vs. short-term project constraints' sheds light on the experiences of experimentation (Madan & Ashok, 2023), seeking continuity from smaller-scale piloting to internationally scalable digital solutions. AI initiatives are frequently structured as short-term, project-based pilots, designed to quickly develop and test new technologies. Our findings suggest that while this approach facilitates rapid implementation, it often overlooks the critical need to build long-term capacity and foster a sense of meaningfulness among civil servants involved in the process. Informants highlighted that AI projects often fail when treated as short-term initiatives without long-term ownership or integration into daily operations. By embedding AI development into routine work and decision-making, municipalities can foster sustained adoption and meaningful impact. As we found, the vagueness of goals and internally driven motives in AI pilot projects diminished employees'sense of fulfilment, which in turn appeared as hesitancy for sustaining ongoing organisational change (Bailey et al., 2018, 2019; Bankins & Formosa, 2023).

Secondly, as AI is opaque and difficult to understand (Pasquale, 2015), its implementation in the public sector is constrained by limited AI literacy or an over-reliance on technology providers. When public sector organisations lack AI expertise, they are forced to learn through practice, often within the confines of pilot projects with restricted resources, influencing work satisfaction. This learning process involves a steep learning curve, driven by the rapid evolution of AI technologies (Koskimies & Kinder, 2024). A unique challenge of AI implementation lies in transferring human knowledge, particularly that of civil servants, into machine systems, through intermediaries, which represents a new form of human–machine interaction. This shift requires public sector employees to adapt to AI's autonomous nature, wherein decision-making becomes partially delegated to machines, raising critical concerns about accountability, transparency, and the long-term implications for public service work. Without a deeper understanding of AI's operations, there is a risk that civil servants may feel alienated or undermined in their roles, further complicating empowerment at work, and organisational readiness for the take-up of new technologies (Kuoppakangas et al., 2019b; Demircioglu & Chen, 2019; Bankins & Formosa, 2023). Hence, AI adoption benefits from structured, ongoing learning involving employees, customers, and developers. This study shows how interactive training, such as enabling employees to act as "bot-whisperers" or content creators, strengthens both AI capabilities and workforce engagement, enhancing mutuality.

In the third dilemma pair 'Managing top-down vs. managing bottom-up encountered' the scope and scale of technology transformations reveal a need for increased mutual co-creation and a more collaborative governance approach to foresight potential ethical issues and build meaningful outcomes. The previous research emphasises the multidisciplinary nature of AI projects bringing together different disciplines and governance (Barrett & Baum, 2017; Hickok, 2020; Rossi, 2018; Watson, 2014) and the importance of how AI is understood in an organisation (Papagiannidis et al., 2023). This study underscores how AI-driven public service projects, such as OuluBot, cut across traditional organisational boundaries, creating new ecosystems of collaboration as they can overcome silos. In contrast, an inhibitor is the top-down coercive involvement of the staff in AI development projects. Hence, when employees' sense of perceived meaningfulness is controlled by organisational practices in a top-down vein, it may lead to artificial "acting as if work were meaningful" (Bailey et al., 2019, 483), replacing the genuinely perceived meaningfulness of AI solution among the employees (Bailey & Madden, 2016; Tourish, 2019; Willmott, 1993). This limits the organisation's willingness to infuse innovation (Mikalef et al., 2021; Schaefer et al., 2021), as top-down governance decreases opportunities to influence and take ownership in

Table 3 Dilemma pair 1, focus codes, dynamics, reconciliations

Dilemma pair 1	Focus codes	Enablers	Inhibitors	Reconciliations
Setting the framework and aim for AI technology vs detecting customer needs	Ways of thinking and constructing development goals	**Clear public objectives:** Establish a clear, shared goal for AI use to align expectations and support public sector values and citizen welfare as AI can have multiple capabilities for public services	**Vague goals and expectations:** Unclear AI capabilities and roles in public services can lead to misaligned development, scope creep, and potential technological push and power imbalances	**Collaborative goal setting:** Initiate AI development projects with a collaborative goal-setting process that includes input from public agencies, policymakers, and citizens
		Ethical AI practices: proactively create an ethical framework to anticipate, address, and mitigate risks throughout AI development and deployment	**AI opacity:** limited understanding of AI's capabilities, technical complexities, and ethical challenges hampers ethical considerations, transparency, and auditing of AI systems	**Impact-oriented development:** Continuously evaluate AI's impact on meaningful organisational performance and customer satisfaction also addressing the ethical issues that may arise
	Participation and commitment	**Inclusive and cross-sectional participation:** Involving both staff and customers early in the development process. Including diverse perspectives and expertise across departments	**Limited customer involvement:** Minimal or passive involvement of customers in the development process hinders the ability to create solutions that truly create public value and wellbeing	**Early and genuine customer involvement:** Move beyond passive data collection by actively engaging customers in the development process, such as through focus groups, surveys, and direct feedback channels
				Transparent communication and feedback loops: Maintain open communication throughout the development process, allowing for ongoing feedback and adjustments to ensure that the technology remains aligned with the shared goals

Table 4 Dilemma pair 2, focus codes, dynamics, reconciliations

Dilemma pair 2	Focus codes	Enablers	Inhibitors	Reconciliations
Learning from practice vs. Short-term project constraints	From project to practice	**Bottom-up input:** Prioritising early employee and citizen input over institutional pressures of organisational or political agendas (process development)	**Top-down imposition:** AI projects are primarily guided by institutional expectations, without adequately considering civil servants'capabilities and available resources	**Balanced development approach:** Realigning organizational priorities with employee and citizen needs instead of optimising novel technologies to existing governance structures
		Needs-based approach: Focusing AI on staff and customer needs for practical, lasting impact (aligning needs)	**Resource constraints:** Inadequate consideration of the resource-intensive nature of AI implementation **Project fatigue:** The ongoing introduction of new projects without sufficient follow-through	**Resource planning and support:** Understanding the extent of the resource-intensive nature of AI implementation, requiring substantial funding and extensive workforce reskilling
	Learning in practice	**Practical learning:** Offer hands-on learning for employees and citizens to boost AI literacy and operational skills	**Lack of practical learning** hinders staff and citizens'ability to understand and interact with AI systems effectively, understand its capabilities and social and ethical implications	**Collaborative learning culture:** Create a learning environment for staff and customers to adapt and improve AI, while training decision-makers on AI limits to set realistic, ethical goals with built-in incentives
		Early involvement and co-creation: Involving staff early in co-creating ideas and ethical considerations boosts engagement and meaning	**Lack of inclusive decision-making:** Employee input is not effectively integrated into AI development and implementation processes	**Sustained cross-sectional cooperation & co-creation:** Form cross-department teams to foster ongoing collaboration and eliminate silos. Build processes for early involvement in ethical considerations and decision making

Table 5 Dilemma pair 3, focus codes, dynamics, reconciliations

Dilemma pair 3	Focus codes	Enablers	Inhibitors	Reconciliations
Managing top-down vs. Managing bottom-up encountered	5) Leadership and governance	**Bottom-up enthusiasm:** Encouraging grassroots innovation, allowing public sector staff to explore AI applications for local needs and build ownership and engagement	**Top-down imposition:** Centralised AI strategies may disconnect from the practical needs of frontline public sector workers and citizens	**Engaging forerunners:** Bottom-up approach involving enthusiastic employees in early development stages, ensuring contributions align with strategic goals. Strategic oversight combined to bottom-up innovation, allowing employees to experiment with AI tools while aligning with broader public service goals
	6) Social cooperation	**Cross-functional cooperation:** Encouraging collaboration across sectors helps create a unified development approach	**Communication barriers:** Different terminologies among stakeholders and the technical team prevent a common understanding	**Unified language:** Facilitate workshops and discussions to develop a common language and understanding among all stakeholders, bridging gaps between technical teams and end-users

the process. While the concept of meaningfulness remains debated (Bailey et al., 2019; Gallie, 1956), the study highlights that involving staff from the outset in the co-development of AI initiatives fosters a more genuine sense of meaningfulness. Therefore, embracing bottom-up management practices can significantly enhance the success of AI development projects.

The lens of meaningfulness allows evaluation of the value of AI technologies for public service providers and citizens, and by whom the meaningfulness is determined (Bailey et al., 2019; Lips-Wiersma & Morris, 2009). This necessitates Graumann's (1995) emphasis on mutuality being tied to communication, dialogue, and shared knowledge, not just between AI systems and users, but also between technical developers, service providers, and decision-makers. The lack of a shared conceptual framework impedes AI implementation and overcoming this requires deliberate efforts to establish a mutual language among stakeholders. The literature on mutuality (Blau, 1964; Guest & Peccei, 2001; Thibaut & Kelley, 1959) posits that successful collaboration hinges on how partners rely on each other to achieve desired outcomes and balance power while acknowledging their differing interests. Current frameworks on mutuality underplay the socio-economic nature of mutuality and such dependencies, especially when public institutions cannot critically assess and guide AI projects. To remedy this, public agencies must actively build internal AI literacy and ensure that AI development is co-designed with a focus on ethical standards, public values, and long-term societal impacts.

It can be noted that OuluBot implementation shared similar dilemmas with previous technology projects in requirements identification, citizen collaboration, clear communication, change management, and skills training. Hence, the challenges with the complexities of implementing ICTs are somewhat persistent and do not solve the dilemmas encountered already in previous eGovernment research (Misuraca et al., 2020). However, two themes stand out as unique to AI technology implementations. Firstly, the need for innovative procurement and experimentation (Madan & Ashok, 2023), and secondly, heightened risks of unethical outcomes. Especially, AI's autonomous nature can perpetuate bias, exacerbate inequality, and compromise privacy on a large scale, often without transparent accountability (Mikalef & Gupta, 2021; Gillath et al., 2021; O'Neil, 2017; Elliott & Soifer, 2022; Oseni et al., 2021). Its rapid deployment in sensitive or high-risk public service areas (Zucker, 1983) further amplifies these societal risks, potential harm and unintended consequences, making the public implementation environment riskier.

6 Conclusions

The motivation behind this study was to explore AI implementation in local public services. As Sigfrids et al. (2023) note, 'it is not enough to understand how AI is developed. To

create sensible governance models, we also need to reflect upon why and under what conditions AI is being developed in light of its potential impacts on communities and societies'. Hence, this research aims to expand understanding of organisational AI governance dilemmas through the lens of mutuality and meaningfulness, with the purpose of understanding how the dilemmas in AI implementation impact its mutuality and meaningfulness, and how these principles facilitate AI implementation in local public service. The study gives insight into how AI technologies can be integrated in a meaningful manner into local services, ensuring that they align with public values and enhance service delivery. The findings support previous acknowledgements from AI governance research (Birkstedt et al., 2023; Mäntymäki et al., 2022) that AI adoption in public services is not simply a matter of technological deployment but an ongoing negotiation between competing demands. Based on the empirical evidence, local governments face a series of interrelated dilemmas including balancing the strategic direction of AI adoption with the dynamic and evolving needs of citizens, reconciling experiential learning with the rigid constraints of short-term project cycles, and navigating the tensions between top-down governance structures and the necessity for bottom-up engagement. While previous research has explored aspects of AI implementation through regulatory, managerial, or ethical perspectives (Mikalef & Gupta, 2021; Wirtz & Müller, 2019), this study contributes by framing these challenges as dynamic governance dilemmas that require continuous negotiation.

To find reconciliations for these dilemmas, this article introduces aspects of mutuality and meaningfulness in AI governance. We propose it as an integrative concept bringing together elements from i) organisational AI implementation and governance (Mäntymäki et al., 2022; Schaefer et al., 2021; Hickok, 2020; Rossi, 2018; Wirtz & Müller, 2019), facilitating ii) meaningfulness (e.g. Bailey et al., 2019; Kuoppakangas et al., 2019b; Martela & Pessi, 2018), and iii) mutuality (e.g. Blau, 1964; Dabos & Rousseau, 2004; Graumann, 1995; Thibaut & Kelley, 1959; Yeoman, 2014, 2019) to support ethical and responsible AI use. The theoretical value lies in its expansion of traditional technology implementation frameworks to encompass the unique challenges posed by AI technologies (Mikalef et al., 2021; Wirtz & Müller, 2019).

While existing research on AI adoption has largely focused on technical, regulatory, and efficiency-related factors (Mikalef et al., 2021; Wirtz & Müller, 2019), this study emphasises the relational and perceptual dimensions that influence successful AI integration. Mutuality, understood as a dynamic process of shared learning and power balancing, is shown to be essential in overcoming governance tensions, particularly in managing top-down versus bottom-up approaches and fostering co-creation (Blau, 1964; Guest & Peccei, 2001). The study further expands existing theoretical AI governance frameworks by linking mutuality to organisational readiness, demonstrating that mutual understanding among public officials, AI developers, and citizens is crucial for aligning AI initiatives with public values and ethical standards. Additionally, meaningfulness is identified as a critical enabler of AI implementation success, influencing how employees and citizens perceive and engage with AI-driven public services (Bailey et al., 2019; Lips-Wiersma & Morris, 2009). The findings highlight that when AI development lacks a sense of meaningfulness, whether due to short-term project constraints, limited employee involvement, or unclear societal benefits, it risks resistance and continuity. Thus, by integrating mutuality and meaningfulness into AI governance, this study provides a novel lens for evaluating and designing AI adoption strategies that are not only technically viable but also socially sustainable, ethically sound, and aligned with the evolving expectations of public service ecosystems (Kinder et al., 2020).

The main practical contributions of this research on AI implementation in local public service provisioning are multifaceted. Firstly, it provides a structured approach to addressing the socio-organisational dilemmas that arise during AI adoption, emphasising the importance of mutuality and meaningfulness in fostering ethical and sustainable AI integration. By examining the experiences of public agents involved in the OuluBot chatbot development, the study offers insights into how AI can enhance service accessibility, efficiency, and citizen engagement while maintaining transparency and accountability. Additionally, the research highlights the need for collaborative governance models that balance top-down and bottom-up approaches, ensuring that AI initiatives are aligned with both organisational objectives and the real needs of employees and citizens. These insights framework can guide public sector organisations in managing the complexities of AI implementation, ultimately contributing to improved public service delivery and societal well-being. Approaches to manage dilemmas are provided in Tables 3, 4, and 5.

This study employed a qualitative single-case design and a holistic approach, which may be considered a limitation. Such a design was chosen because it is well-suited for complex, context-specific topics (Gustafsson, 2017; Kuoppakangas et al., 2019b). The study followed to Guba's (1981) criteria for trustworthiness: ensuring rich data, theory triangulation, transferability to similar settings, detailed reporting, and an audit trail. Future research should conduct multiple-case studies to validate the framework across various countries, as the Finnish context may not be universally applicable. Another limitation is the focus on the public sector, which may limit the findings'applicability to private sector AI initiatives or other sectors with different operational and stakeholder dynamics. Comparative studies between public and private sectors could identify sector-specific challenges and strategies for improving mutuality and meaningfulness in AI implementation.

The study also primarily addresses short-term challenges, without fully exploring the long-term impacts of AI systems or the evolution of stakeholder relationships. Longitudinal research could provide insights into how AI projects develop over time and their lasting effects on public sector operations. Lastly, the study may not fully capture the complexities of power dynamics and conflicting interests among stakeholders. Future research should include a wider range of stakeholders, including marginalised or less vocal groups, to gain a more comprehensive understanding of these dynamics and ensure a more inclusive approach to AI implementation.

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Data Availability The data that has been used is confidential. Hence, the data that support the findings of this study are not publicly available nor accessible upon request.

Declarations

Conflict of interest The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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