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Women in ICT in Estonia's Public Sector
Exploring Challenges, Opportunities, and Strategies for Advancing Gender Diversity, Equity, and Inclusion

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This has been the most intellectually rewarding experience of my academic journey so far. I've learned enormously—academically, professionally, and personally—and am grateful for the people who were involved in this journey. Firstly, I am grateful for the academic freedom to work on this topic. Being allowed and supported to explore a subject I genuinely care about made me realize how fortunate I am. As I read academic papers across fields—from gender studies, organizational culture, and public policy to DEI, representative bureaucracy, tokenism, glass ceiling, and the relationship between technology and gender—I often revisited questions I had long been thinking about or hearing, and occasionally found some answers. These were my "aha moments", the genuine source of motivation for this research: why there are fewer women in decision-making and leadership roles, why women are sometimes expected to adopt masculine traits. I recalled news about judgment toward female politicians, and how women tend to attribute their success to luck rather than to their competence and capabilities and often being asked about how they balance work and life.

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Abstract

In the era of digital governance, gender diversity, equity, and inclusion (DEI) in the public sector ICT domain is essential for inclusive innovation, equitable growth, and responsive public service delivery. Estonia, despite its global digital leadership, continues to exhibit gender imbalances—particularly in technical and leadership roles within public ICT institutions. While prior research has centered on the private sector, SMEs, or STEAM education, gender dynamics in the public ICT sector remain understudied. This study investigates whether and why under-representation of women exists in Estonia's public sector ICT domain, and examines the barriers they face—if any. It further explores how institutional structures, organizational cultures, and representational dynamics shape women's participation, advancement, and influence.

Drawing on in-depth interviews with ten professionals from six public ICT-focused agencies within Estonia—including technical, HR, legal, and strategic roles—the study reveals that gender-neutral recruitment policies coexist with persistent barriers such as occupational segregation, pay gaps, caregiving burdens, perfectionism, and stereotypes rooted in education, family, and social norms. Formal DEI efforts remain fragmented or invisible.

The study contributes to research on representative bureaucracy and gendered institutions, offering practical and policy recommendations and emphasizing the need to promote diverse ICT career paths—particularly in the public sector—through education and early professional orientation. Moreover, it identifies existing research gaps in this area and offers directions for future investigation.

Keywords: Gender Diversity; Public Sector; ICT; DEI; Estonia

Content

Figures

Tables

Abbreviations

AKI	Andmekaitse Inspektsioon (Data Protection Inspectorate)
DEI	Diversity, Equity, and Inclusion
DESI	Digital Economy and Society Index
EGA	E-riigi Akadeemia (e-Governance Academy)
EIGE	European Institute for Gender Equality
ETAG	Eesti Teadusagentuur (Estonian Research Council)
EU	European Union
GDPR	General Data Protection Regulation
HR	Human Resources
ICT	Information and Communication Technology
IT	Information Technology
OECD	Organisation for Economic Co-operation and Development
RIA	Riigi Infosüsteemi Amet (Information System Authority)
RIK	Registrite ja Infosüsteemide Keskus (Centre of Registers and Information Systems)
RMIT	Rahandusministeeriumi Infotehnoloogiakeskus (IT Centre of the Ministry of Finance)
STEM	Science, Technology, Engineering, and Mathematics
TEHIK	Tervise ja Heaolu Infosüsteemide Keskus (Health and Welfare Information Systems Center)
UNDP	United Nations Development Programme
eID	Electronic Identification

1. Introduction

Research Motivation

Gender imbalance in ICT is not only a matter of fairness but also a missed opportunity for economic innovation and societal progress. Gender-diverse teams have been shown to enhance creativity, problem-solving, and decision-making, all of which are critical for driving innovation and long-term economic resilience (Bear & Woolley, 2011). However, systemic barriers—such as gender stereotypes, the glass ceiling, and gender wage gaps—continue to hinder women's career advancement, particularly in leadership roles. These challenges are often amplified in the public sector, where hierarchical structures and traditional norms may restrict the effectiveness of Diversity, Equity, and Inclusion (DEI) strategies (Acker, 2006; McCandless et al., 2022; Blau & Kahn, 2017). Despite this, the public sector remains a critical site for digital transformation efforts, making gender-inclusive leadership particularly salient for equitable governance and innovation.

The European Union's Digital Decade 2030 targets emphasize the critical role of digital skills and gender equality in driving inclusive economic growth across Europe. By 2030, the EU aims to equip at least 80% of individuals aged 16–74 with basic digital skills and employ at least 20 million ICT specialists, with a particular focus on achieving gender balance in the sector (European Commission, 2023). Despite these ambitious goals, significant gender disparities persist in the ICT sector. As of 2021, 81% of ICT specialists in the EU were male, underscoring the severe under-representation of women in this key area (OECD, 2021).

In the public sector, gender diversity is especially important because the public sector is responsible not only for designing digital policies but also for ensuring that these policies are inclusive and reflect the needs of all citizens. When women are underrepresented in leadership roles within public sector ICT agencies, it limits the potential for gender-sensitive digital governance and weakens the ability to create

policies that benefit all citizens. Moreover, public sector ICT agencies serve as role models for other sectors and society at large, influencing broader social attitudes about the importance of gender equality in technology.

Why Estonia?

Estonia offers a valuable context for examining gender diversity in public sector ICT roles. As one of the most advanced digital societies globally, Estonia has placed e-governance at the center of its public service model. The country's achievements in digital infrastructure—including digital ID systems, e-residency, and internet voting—have made it a global reference point for digital transformation.

Despite these developments, gender disparities remain visible. Women represent 24.5% of the ICT workforce in Estonia, a figure that exceeds the EU average of 18.9% but still reflects , particularly in senior and technical leadership roles (European Commission, 2023c). While several initiatives, such as the Estonian Digital Agenda 2030 and EU-supported programs, aim to increase women's participation in ICT, persistent challenges include the gender pay gap and limited representation in decision-making positions. In 2023, the unadjusted gender pay gap in Estonia's information and communication sector was approximately 19.7%, compared to a national average of around 14% (Statistics Estonia, 2023).

The Estonian public sector plays a central role in digital innovation, with ICT forming a foundational pillar of public administration. As a digital pioneer, Estonia's commitment to advancing inclusive digital governance offers a unique opportunity to explore how gender equity is addressed—or overlooked—in its ICT-related public institutions.

By improving gender representation in public sector ICT leadership, Estonia has the potential to contribute meaningfully to the EU's Digital Decade 2030 goals and to set an example for inclusive policy-making in the digital era.

Problem Definition

This study examines the barriers and opportunities experienced by women working in Estonia's public sector ICT agencies. It focuses on issues such as gender stereotypes, the pay gap, recruitment and promotion practices, and the presence (or absence) of glass ceilings. Additionally, it explores the availability of Diversity, Equity, and Inclusion (DEI) mechanisms—such as mentorship, leadership development, or internal targets—intended to support women's advancement or broader DEI goals.

Beyond identifying individual and organizational challenges, the study investigates how gender-inclusive workplaces may contribute to institutional objectives, including innovation, democratic legitimacy, and equitable service delivery. Drawing on in-depth interviews with women professionals across different public ICT agencies, the study seeks to identify both persistent structural and cultural barriers and to highlight concrete, practitioner-driven recommendations for advancing gender DEI in Estonia's digital governance landscape.

Research Questions

This study investigates the gendered dynamics of Estonia's public sector ICT workforce through a qualitative, interview-based inquiry. It focuses on understanding both the challenges women encounter and the institutional mechanisms that influence their professional experiences.

The research is guided by the following questions:

1. What are the benefits of having a more diverse, equitable, and inclusive environment in the public sector ICT domain?
2. What DEI-related initiatives, if any, have been implemented to support women's inclusion in Estonia's public sector ICT domain?
3. What challenges do female ICT professionals face in Estonia's public sector ICT domain?

These questions are designed to explore both individual-level experiences and organizational-level patterns. Grounded in prior literature on representative bureaucracy, and DEI in the public sector, the study adopts an analytical framework introduced in Chapter 2. This framework comprises three interrelated dimensions: institutional structure, organizational culture, and representational agency. It informs both the interview design and the analytical process, allowing for a multidimensional examination of how gender inclusion is experienced, practiced, and contested in the public sector ICT domain.

Novelty Statement

While substantial research has examined gender disparities in the private sector ICT workforce—often focusing on wage gaps, female entrepreneurship, and access to funding—as well as gender imbalances in ICT education and STEM fields more broadly, relatively little attention has been paid to gender diversity, equity, and inclusion (DEI) within public sector ICT domain. This study addresses this critical gap by investigating DEI-related dynamics in Estonia's public sector ICT agencies—a core pillar of the country's digital governance model and a globally recognized e-state, yet an area often overlooked in the existing academic literature.

Drawing on insights from ten respondents from six major public ICT agencies, the research captures a wide range of lived experiences across seniority levels, technical and non-technical specializations, and institutional affiliations. The respondents reflect diverse professional backgrounds—including programming, cybersecurity, legal regulation, digital policy, and human resources—offering a rich empirical foundation for understanding how gender operates within the organizational and institutional logics of Estonia's digital state apparatus.

Guided by an analytical framework grounded in representative bureaucracy, the study explores how institutional structures, organizational cultures, and representational agency influence women's opportunities, barriers, and contributions in the public ICT

domain. In doing so, it aims to addresses a theoretical and empirical research gap while also responding to pressing policy needs.

This research aligns with broader EU strategic goals, and the Digital Decade targets, which call for increased female participation in digital roles and inclusive public services. It also speaks to the growing shortage of ICT professionals across the EU and Estonia, highlighting the potential of more inclusive public sector pathways to attract and retain diverse talent. The study offers practical recommendations for enhancing gender equity in digital public governance and identifies areas for future research.

2. Theoretical Background

To provide a comprehensive foundation for the empirical investigation, this section presents a structured review of key theoretical and conceptual frameworks concerning diversity, equity, and inclusion (DEI), with a particular focus on gender,within the scope of this study. It is organized into three main sections. Section 2.1 outlines the general theoretical underpinnings of DEI, DEI concept and importance, systemic barriers to achieving broader DEI and also special role of organizational culture.Section 2.2 narrows the focus to the Information and Communication Technology (ICT) sector, where gender-based disparities and professional norms intersect with organizational practices. Section 2.3 turns to the public sector, applying the lens of representative bureaucracy to explore how gender DEI is shaped by institutional structures and state-level dynamics. The chapter concludes with an integrative framework that synthesizes insights from all three domains, offering a conceptual lens to inform the empirical analysis in the following section.

2.1 DEI (Diversity, Equity, Inclusion) with a Focus on Gender

Diversity, Equity, and Inclusion (DEI) are foundational concepts in organizational research and practice, aimed at creating fair, respectful, and supportive environments

where all individuals can fully participate and thrive. Diversity refers to the presence of differences among individuals in social identity categories such as gender, race, ethnicity, age, disability, and cultural background (Mor Barak, 2015). Equity focuses on acknowledging and addressing systemic barriers to ensure fair access to opportunities, resources, and outcomes (Shore et al., 2011). Inclusion emphasizes fostering a culture where individuals from diverse backgrounds feel valued, respected, and empowered to contribute meaningfully to organizational decision-making processes (Shore et al., 2011).

A growing body of research highlights that organizations embracing DEI principles not only promote fairness and representation but also benefit from enhanced innovation, creativity, and performance (Shore et al., 2011). While DEI encompasses multiple dimensions of diversity, this section specifically focuses on gender. The following subsections examine how gender diversity, equity, and inclusion influence organizational dynamics and performance.

2.1.1 Gender Diversity: Concept and Importance

Gender diversity refers to the presence of individuals of different gender identities within an organization, encompassing variations in gender composition, roles, and interpersonal dynamics (Bear & Woolley, 2011). Research suggests that gender-diverse teams are better positioned to enhance creativity, innovation, and problem-solving capabilities, as the inclusion of diverse perspectives fosters more comprehensive decision-making processes (Herring, 2009).

One key mechanism through which gender diversity enhances group effectiveness is by improving team collaboration and collective intelligence. Woolley et al. (2010) found that teams with a higher proportion of women demonstrated greater collective intelligence, not because of individual members' IQ but due to the group's social sensitivity and the quality of interpersonal interactions. Women tend to exhibit higher levels of social perceptiveness and encourage balanced participation, which promotes

responsive communication patterns and ensures that the knowledge and skills of all team members are effectively utilized. (Eagly & Carli, 2003, 2014; Bear & Woolley, 2011).These dynamics are particularly beneficial for tackling complex tasks that require coordination, cooperation, and adaptive problem-solving.

Empirical studies further support this argument. Herring (2009) found that gender-diverse groups are statistically more likely to produce innovative outcomes compared to homogeneous teams. Herring (2009), using a large-scale national dataset, found that gender-diverse organizations reported higher sales revenue, increased customer numbers, and greater relative profits. This aligns with the broader argument that diversity enhances organizational capacity and effectiveness.However, the positive impact of gender diversity on group processes and performance is not guaranteed and often depends on contextual factors such as organizational norms, team composition, and leadership style.

Kanter's (1977) theory of tokenism highlights the challenges that arise when women are significantly underrepresented. In male-dominated environments, women may be perceived as symbolic representatives of their gender rather than as individual contributors. This heightened visibility can reinforce stereotypes, increase pressure on female employees, and limit their influence within the group. Such dynamics risk marginalizing women and undermining the potential benefits of diversity.

Building on Kanter’s work, recent studies emphasize the importance of achieving a critical mass of women in decision-making positions to overcome tokenism and enable women to exert meaningful influence. For instance, Amorelli and García-Sánchez (2020), in their bibliometric review of gender diversity and corporate social responsibility (CSR), found that women’s presence on corporate boards positively impacts organizational commitment to sustainable development and stakeholder engagement. However, these positive outcomes are more likely when female representation reaches a sufficient threshold, allowing women to participate actively rather than symbolically. Their work also highlights that contextual factors,

such as institutional environments and organizational culture, further moderate the impact of gender diversity on strategic decision-making and performance (Amorelli & García-Sánchez, 2020).

Similarly, Ely (1995) argues that women in these settings often face expectations to conform to masculine norms, which can suppress their unique perspectives and ultimately weaken the intended value of diversity.

Moreover, the relationship between gender diversity and organizational performance is complex and contingent on the organization's inclusivity. Ely and Thomas (2001) contend that the advantages of gender diversity are most evident in organizations that foster an inclusive culture—one where diverse voices are not only present but also valued and integrated into decision-making processes. Without such a culture, organizations may struggle to capitalize on the potential benefits of diversity, as women's contributions risk being overlooked or undervalued.

Meta-analytic research by Joshi and Roh (2009) further supports this context-dependent perspective, indicating that gender diversity's impact on team performance varies with task complexity, industry norms, and the degree of social integration within the team. While diversity can enhance creativity and innovation, it may also trigger resistance or amplify social divisions if not managed within a supportive and inclusive environment.

In sum, while gender diversity holds great potential to strengthen team dynamics, enhance collective intelligence, and improve organizational outcomes, its effectiveness depends heavily on organizational context and the presence of inclusive practices. Ensuring that gender diversity translates into meaningful participation and influence remains critical to realizing its full benefits.

2.1.2 Gender Equity: Addressing Systemic Barriers

Gender equity refers to fairness of treatment for women and men, according to their respective needs. This may include equal treatment or treatment that is different but considered equivalent in terms of rights, benefits, obligations, and opportunities. In contrast, gender equality refers to the equal rights, responsibilities, and opportunities of women and men and girls and boys. While the two concepts are related, equity is the means, and equality is the result. Therefore, achieving gender equality often requires gender equity as an essential process (UN Women, 2011).

In academic research, equity is increasingly recognized as a necessary lens to uncover and address systemic barriers that hinder women's access to equal opportunities. Nishii (2013) argues that simply increasing the number of women in organizations does not guarantee fairness, particularly when underlying structural biases remain unchallenged. Tokenistic inclusion without cultural transformation fails to achieve meaningful equity.

One of the most persistent examples of structural inequity is the gender wage gap. In their U.S.-based study, Blau and Kahn (2017) find that women earn approximately 80% of what men earn, even after adjusting for human capital factors such as education and experience, indicating persistent structural inequities. Though this study is U.S.-focused, global data show similar trends: the World Economic Forum's *Global Gender Gap Report* (2024) indicates that economic participation and opportunity for women remain significantly behind men worldwide, with only 60.5% gender parity in this dimension. According to the 2024 Global Gender Gap Index, no country has yet achieved full gender parity.

Barriers to leadership also illustrate systemic inequities. Ryan and Haslam (2005) introduced the concept of the "glass cliff," where women are more likely to be appointed to leadership roles during organizational crises, setting them up for failure. This phenomenon follows the earlier notion of the "glass ceiling," which refers to

invisible yet enduring barriers that prevent women from advancing to top leadership roles. These patterns are embedded in organizational cultures and reinforce gendered stereotypes of competence and risk.

More recently, a systematic review by Guthridge et al. (2022) analyzed a wide range of interventions aimed at promoting gender equality across various sectors, including education, healthcare, and corporate environments. The interventions examined ranged from gender-sensitivity training and leadership programs to policy reforms and structural changes within organizations. While many of these initiatives showed potential for positive change, the authors concluded that the impact of such interventions is often constrained by entrenched organizational cultures, weak enforcement mechanisms, and lack of long-term commitment. Structural and cultural transformation, particularly in male-dominated sectors remains limited. The review highlights the need for multi-level, sustained strategies that go beyond surface-level inclusion efforts to address the deeper systemic roots of gender inequity.

2.1.3 Gender Inclusion: Beyond Representation

In the twenty-first century, organizational attention to diversity and inclusion has grown significantly, influenced by increased female workforce participation and the involvement of individuals from diverse cultural and generational backgrounds (Garg & Sangwan, 2021). While these terms are often used jointly, scholars have highlighted conceptual distinctions between them. Diversity typically refers to demographic heterogeneity, whereas inclusion concerns the extent to which individuals are integrated into organizational processes, have access to opportunities, and are treated as valued contributors (Roberson, 2006). As Sabharwal (2015, as cited in Garg & Sangwan, 2021) notes, current diversity initiatives have increasingly led to the emergence of inclusion as a distinct and deeper concept.

Roberson's (2006) empirical study distinguishes diversity from inclusion by identifying the latter through indicators such as influence in decision-making, access

to information, and job security. Her research suggests that inclusion goes beyond numerical representation and requires the removal of barriers that prevent full employee engagement.

Further expanding the conceptualization of inclusion, Nishii (2013) introduced the construct of "climate for inclusion," defined as organizational conditions that ensure identity group status is unrelated to access to resources or participation. Her findings indicate that in inclusive climates, gender-diverse groups report lower levels of interpersonal conflict and higher collective satisfaction. These outcomes are attributed to the reduction of social categorization processes and the promotion of cross-cutting interpersonal ties, which are particularly relevant in gender-diverse contexts.

Shore et al. (2011) synthesized existing literature to propose a model in which inclusion is achieved at the intersection of two key elements: belongingness and uniqueness. Their review underscores that inclusive work environments enable individuals to be accepted as members of the group while simultaneously allowing them to maintain and express their distinct identities. This balance is presented as essential for realizing the positive outcomes of inclusion.

In addition to conceptual developments, scholars have also examined structural barriers to gender inclusion. Ryan and Haslam (2005), through their "glass cliff" research, identify that women are more likely to be appointed to leadership roles during periods of organizational crisis. Their archival analysis of FTSE 100 (Financial Times Stock Exchange 100) companies shows that female leaders are disproportionately represented in high-risk leadership contexts, raising concerns about the stability and authenticity of inclusion efforts.

Taken together, these studies suggest that gender inclusion in the workplace requires more than representational parity—it depends on sustained structural, relational, and cultural conditions that enable full and equitable participation. The literature

consistently emphasizes the need to develop inclusive climates that support not only presence but also voice, influence, and belonging.

2.1.4 The Role of Organizational Culture in Gender DEI

Organizational culture plays a pivotal role in determining the success or failure of diversity, equity, and inclusion (DEI) efforts, particularly in relation to gender. Research highlights that beyond formal policies, cultural norms shape how DEI initiatives are implemented, experienced, and sustained (Ely, 1995; Mor Barak et al., 1998; Acker, 2006; Dobbin & Kalev, 2018).

Ely (1995) examines how women in male-dominated workplaces navigate identity and legitimacy. Her findings suggest that women often feel pressure to conform to dominant masculine norms to gain acceptance, which undermines their authenticity and limits their ability to challenge institutional biases. This conditional inclusion highlights how cultural expectations may constrain the benefits of gender diversity, even in organizations with formal equality policies.

Mor Barak, Cherin, and Berkman (1998) contribute a dual-level conceptualization of diversity climate, distinguishing between formal structural policies and individuals' lived experiences of fairness and inclusion. They argue that for DEI initiatives to be effective, there must be alignment between organizational commitments and everyday practices.

Acker (2006) offers a structural perspective by theorizing organizations as inherently gendered through what she calls "inequality regimes." These regimes are embedded in seemingly neutral workplace practices—such as evaluation criteria, career progression models, and role expectations—that often reflect masculine ideals like linear career trajectories, competitiveness, and autonomy. As such, organizational culture can reproduce gender hierarchies even in the presence of formal equity policies.

More recent scholarship has drawn attention to cultural resistance against DEI. Dobbin and Kalev (2018) argue that diversity initiatives are often adopted as symbolic gestures, lacking the institutional will to address power imbalances. Similarly, Iyer (2022) identifies perceived "resource," "symbolic," and "moral" threats among dominant group members as key drivers of resistance to inclusion, which can manifest as passive noncompliance or active backlash.

These perspectives underscore that organizational culture is both a constraint and a lever in the advancement of gender DEI. Sustainable progress requires cultural transformation in tandem with structural interventions, ensuring that inclusion is not only formalized through policy but also normalized through everyday organizational life (Ely, 1995; Mor Barak et al., 1998; Acker, 2006; Dobbin & Kalev, 2018; Iyer, 2022).

2.2 DEI in the ICT Domain (Gender Perspective)

As discussed in the previous section, gender DEI is a multidimensional construct influenced by organizational, cultural, and structural dynamics. The Information and Communication Technology (ICT) sector offers a particularly salient context for examining gendered inequalities, given its central role in the digital economy and persistent male dominance. Despite decades of policy and organizational efforts, women remain significantly underrepresented in both technical and leadership roles. This section applies the theoretical insights from DEI literature to the ICT context, with attention to barriers, internal organizational dynamics, inclusion practices, and leadership structures.

2.2.1 Gender Gap in ICT: Structural and Cultural Barriers

Gender disparities in the information and communication technology (ICT) sector are not only a result of under-representation but are also reinforced by structural and cultural barriers that shape perceptions of belonging and competence (Cheryan, Master, & Meltzoff, 2015; Faulkner, 2009). A consistent theme in the literature is that

technical roles are culturally associated with masculinity, which contributes to gendered expectations and workplace norms (Cheryan et al., 2015). These associations influence both individual career choices and organizational cultures, often discouraging women from entering or persisting in ICT fields.

Faulkner (2009) describes this dynamic as the "in/visibility paradox," where women in technical environments are simultaneously hyper-visible as gender minorities yet invisible in terms of their professional legitimacy. This paradox creates a working context in which women may feel pressure to constantly prove their competence while being excluded from informal networks and decision-making processes. Ashcraft, Eger, and Scott (2016) similarly argue that women in ICT are often evaluated more critically than their male peers and held to higher standards of performance, particularly in roles involving technical authority.

These structural dynamics are further entrenched by organizational norms and practices. Gendered assumptions embedded in hiring criteria, promotion paths, and performance evaluations may reinforce existing inequalities, even in organizations that formally support diversity (Faulkner, 2009; Ashcraft et al., 2016).For example, evaluation metrics emphasizing continuous availability and individual achievement may disproportionately disadvantage those with caregiving responsibilities—a burden still largely borne by women. Such practices intersect with masculine cultural norms in STEM that reinforce gendered expectations and discourage women's participation (Cheryan et al., 2015).

In addition, dominant narratives within ICT often frame success in terms of innate brilliance or exceptional talent, rather than collaboration or effort (Bian, Leslie, & Cimpian, 2017). Research suggests that such meritocratic ideals can unintentionally perpetuate exclusion by aligning with stereotypically male-coded attributes, which may dissuade women from seeing themselves as a good fit for technical roles. This alignment of organizational culture with narrow conceptions of competence can create

psychological and structural barriers that persist despite interventions aimed at increasing gender diversity.

Collectively, these studies highlight that gender inequality in ICT is maintained not only through numerical under-representation but also through deep-rooted cultural narratives and institutional practices. Addressing these challenges requires attention to the ways in which gender norms are embedded within organizational structures and workplace expectations (Faulkner, 2009; Ashcraft et al., 2016; Cheryan et al., 2015; Bian et al., 2017).

2.2.2 Organizational Dynamics and Occupational Segregation

Gender-based occupational segregation persists in the ICT sector, even in contexts where formal diversity initiatives are present. This segregation operates both horizontally—through the concentration of women in non-technical or peripheral roles—and vertically, through limited access to senior or decision-making positions (OECD, 2021; European Commission, 2020). Organizational dynamics, including informal structures and normative expectations, play a significant role in reinforcing these patterns.

Research has shown that women in ICT organizations are often assigned to roles perceived as less technical, such as coordination, communication, or user support functions, whereas men dominate development, infrastructure, and leadership roles (Ashcraft, Eger, & Scott, 2016; OECD, 2021).These role allocations are not solely the result of formal job descriptions but are also shaped by assumptions about gendered competencies and work styles. Acker (2006) conceptualizes these patterns as part of "inequality regimes," where ostensibly neutral organizational processes reproduce gender hierarchies through recruitment, task distribution, and promotion practices.

Inclusion in organizational decision-making structures is also shaped by informal dynamics. Roberson (2006) emphasizes that diversity, in the absence of genuine inclusion, fails to alter the distribution of power and influence. Access to key projects,

visibility within teams, and participation in informal networks often determine career progression in ICT settings. When these networks are male-dominated, women may face exclusion from crucial informal support systems that facilitate advancement.

Dobbin and Kalev (2018) note that many corporate DEI programs focus on formal representation without addressing the underlying dynamics of workplace stratification. For instance, mentoring or leadership training programs may coexist with unchanged internal norms that continue to favor traditional, male-centered models of success. Ely and Thomas (2001) similarly argue that without an organizational learning environment that values identity-related perspectives, DEI efforts may yield limited change in team functioning and performance outcomes.

Furthermore, the under-representation of women in technical leadership roles can reinforce organizational norms that equate competence with masculinity, creating a feedback loop that perpetuates exclusion (Ryan & Haslam, 2005). Such dynamics are often subtle and embedded in everyday interactions, making them resistant to change through isolated interventions.

These literature suggests that occupational segregation in ICT organizations is maintained not only through structural mechanisms but also through informal practices and cultural expectations. Addressing these dynamics requires attention to how inclusion is enacted beyond policy and how organizational processes assign value, visibility, and legitimacy to particular roles and individuals (Acker, 2006; Charles & Bradley, 2009; Roberson, 2006; Dobbin & Kalev, 2018; Ely & Thomas, 2001; Ryan & Haslam, 2005; Ashcraft et al., 2016).

2.2.3 Barriers to Entry and Socialization

The gender imbalance in the ICT sector is not solely a product of workplace dynamics but is shaped long before individuals enter the labor market. A growing body of research emphasizes how early socialization processes, shaped by cultural beliefs, institutional practices, and psychological responses, influence girls' orientation

toward technical fields (Bian, Leslie, & Cimpian, 2017). These processes contribute to differential exposure, confidence, and sense of belonging, which cumulatively shape entry pathways into ICT careers.

One foundational mechanism is the internalization of beliefs about intellectual ability. Bian et al. (2017) demonstrate that girls as young as six are less likely than boys to associate their gender with high-level intellectual ability. This early stereotype, which emerges well before formal academic differentiation, reduces the likelihood that girls will see themselves as suited for fields perceived to require brilliance—such as computer science or engineering.

These beliefs are reinforced by broader socialization experiences in schools and families. Charles and Bradley (2009) argue that educational systems in many developed countries encourage gender differentiation through curricular choices and informal signaling. For instance, teachers and parents may—often unconsciously—encourage girls toward collaborative, human-centered subjects while treating boys' interest in technical domains as more normative. This divergence is further amplified when girls encounter few female role models in STEM, making it more difficult to identify with the field.

Institutional features of educational environments can also act as gatekeeping mechanisms. Cheryan, Ziegler, Montoya, and Jiang (2017) find that introductory computer science courses that emphasize prior experience, individual competition, or abstract content tend to discourage students without early exposure—disproportionately affecting girls. These course structures implicitly reward those who fit the dominant stereotype of the "ideal coder," further entrenching perceptions of non-belonging.

In addition to external influences, psychological mechanisms play a role. Walton and Cohen (2007) describe the phenomenon of "belonging uncertainty," in which individuals from underrepresented groups interpret everyday academic challenges as

evidence that they do not belong. In environments that lack inclusive cues or identity-affirming structures, this uncertainty may lead capable students—particularly women—to disengage from ICT pathways, even when their performance is adequate.

Together, these findings suggest that gendered barriers to ICT careers emerge well before workforce entry. They are shaped by a cumulative process of socialization that influences how individuals perceive their ability, their fit within technical environments, and the relevance of ICT to their aspirations. The lack of relatable role models during this period further limits girls' ability to envision themselves in ICT roles, a theme that will be explored in the following section (Bian et al., 2017; Charles & Bradley, 2009; Cheryan et al., 2017; Walton & Cohen, 2007).

2.2.4 The Importance of Role Models

The importance of role models is mentioned frequently in the litertuare and how it plays a critical role in shaping women's participation and persistence in the ICT sector. Role models serve as symbolic figures that can expand individuals' perceptions of what is possible and who belongs in a given professional space. For women in male-dominated fields such as ICT, visible female role models may influence both career aspirations and self-concept by countering prevailing gender stereotypes and offering alternative identity pathways (Cheryan, Siy, Vichayapai, Drury, & Kim, 2011).

Research shows that exposure to successful women in technology can enhance girls' interest in pursuing technical careers, especially when those role models appear competent, authentic, and relatable (Dasgupta, 2011). Role models who share similar backgrounds or experiences are particularly effective in increasing motivation and reducing self-doubt. Dasgupta (2011) describes this as "stereotype inoculation," wherein observing others from one's group succeed in counter-stereotypical roles helps to buffer the psychological impact of negative cultural narratives.

The effectiveness of role models is also influenced by their visibility within educational and organizational environments. Cheryan et al. (2015) emphasize that female students in computer science are more likely to persist when they see women represented among instructors, guest speakers, or professionals featured in classroom content. Conversely, when female presence is minimal or tokenistic, women may interpret this as a sign that they do not belong, reinforcing the broader pattern of exclusion and self-selection out of technical fields.

Importantly, role models influence not only career interest but also perceptions of leadership and legitimacy. In professional environments, the scarcity of women in senior ICT roles can limit younger women's ability to visualize themselves in such positions. This absence reinforces the idea that leadership in technology is inherently male, which can diminish women's aspirations and sense of career trajectory (Ashcraft, Eger, & Scott, 2016).

The visibility of female role models in both education and senior ICT positions is crucial for sustaining women's participation, as their absence signals exclusion and limits aspirations (Cheryan et al., 2015; Ashcraft et al., 2016).

While role models are not a substitute for structural reform, their symbolic and motivational power is widely recognized. They serve as both psychological resources and cultural signals, helping to expand the range of identities considered legitimate within ICT. As such, increasing the visibility and accessibility of female role models remains a crucial component of broader DEI efforts in technical domains (Cheryan et al., 2011; Dasgupta, 2011; Ashcraft et al., 2016).

2.2.5 Interventions and Inclusion Practices

Efforts to promote gender diversity, equity, and inclusion (DEI) in the ICT sector often involve a range of organizational interventions. These include diversity training, mentorship programs, affinity groups, inclusive recruitment practices, and leadership development initiatives. While such practices are widely adopted, research has raised

questions about their effectiveness, particularly in male-dominated sectors like ICT where deep-seated cultural norms may undermine formal efforts (Dobbin & Kalev, 2016; Roberson, 2006).

One commonly implemented strategy is diversity training, intended to raise awareness of unconscious bias and foster inclusive behaviors. However, empirical evidence suggests that mandatory training programs may yield limited results and can even provoke resistance if perceived as coercive or punitive (Dobbin & Kalev, 2018). Iyer (2022) identifies three types of perceived threat—resource, symbolic, and moral—that can explain why some members of dominant groups react defensively to DEI initiatives. These psychological mechanisms help explain why even well-intentioned programs may lead to disengagement or backlash when not properly contextualized.

Mentorship and sponsorship programs are also widely used to support women in ICT roles. These interventions aim to provide guidance, increase visibility, and offer access to informal networks that are often critical for career advancement. Research by Kalev, Dobbin, and Kelly (2006) finds that mentorship-based strategies, especially when embedded in formal programs, tend to be more effective than diversity training alone. Yet, their success often depends on the organizational climate in which they operate. Nishii (2013) emphasizes the distinction between diversity climate and inclusion climate, arguing that structural efforts are insufficient if the workplace environment does not actively affirm the value of diverse perspectives.

Ashcraft, Eger, and Scott (2016) further highlight that many DEI programs in the tech sector fail to address the deeper cultural dynamics that limit women's advancement. They find that women frequently experience "diversity fatigue" when initiatives are poorly designed or when participation in them becomes a form of symbolic visibility without real influence. This underscores the importance of designing interventions that align with organizational values and are responsive to the lived experiences of underrepresented groups.

Ely and Thomas (2001) propose that the most effective DEI strategies emerge from a "learning-and-effectiveness" paradigm, where diversity is treated as a resource for organizational innovation and improvement. In contrast, when diversity efforts are framed primarily as compliance with legal norms or external pressures, they risk becoming symbolic gestures that fail to shift internal practices.

Moreover, inclusion practices are most impactful when embedded in everyday decision-making processes. This includes equitable task assignments, transparent promotion criteria, and participatory leadership structures. Without such structural integration, DEI policies may lead to what Dobbin and Kalev (2016) call "organizational decoupling," where official commitments to diversity coexist with persistent exclusion in practice.

Despite challenges in implementation, numerous studies highlight the organizational and societal benefits of achieving greater gender inclusion in ICT. Diverse technical teams have been linked to improved innovation, broader product applicability, enhanced decision-making, and better team dynamics (Ashcraft, Eger, & Scott, 2016; Roberson, 2006; McKinsey & Company, 2018). Furthermore, inclusive workplaces tend to foster higher job satisfaction and employee retention, which are particularly crucial in competitive and evolving technical environments. These outcomes underline the broader institutional value of embedding DEI not only as a compliance goal but as a strategic imperative (Ashcraft et al., 2016; Roberson, 2006; McKinsey & Company, 2018).

2.3 DEI in the Public Sector: Representative Bureaucracy (Gender Perspective)

2.3.1 Theoretical Foundations of Representative Bureaucracy

The concept of representative bureaucracy has long served as a theoretical foundation for examining equity and inclusion in public administration. Originally formulated by Kingsley (1944) and later expanded by Mosher (1968), the theory distinguishes between *passive* and *active* representation. Passive representation refers to the

demographic resemblance between bureaucrats and the population they serve, while active representation occurs when officials take actions aligned with the interests of those social groups (Mosher, 1968).

In the gender context, passive representation is achieved when women are present in public service roles, especially at decision-making levels. However, active representation depends on whether these women are empowered and institutionally positioned to influence policies in ways that address gender-specific concerns (Meier & Nicholson-Crotty, 2006). Thus, the theory not only underscores the symbolic significance of diversity in public bureaucracies but also links it to tangible outcomes in service delivery and governance.

Recent scholarship has emphasized that representation should not be evaluated solely in numerical terms. Van de Walle and Groeneveld (2010) propose a contingency approach that highlights three interrelated conditions—power, equal opportunity, and diversity—as prerequisites for effective representation. They caution against reducing representation to managerial performance gains, stressing its normative role in reinforcing public legitimacy. Similarly, Riccucci and Van Ryzin (2017) argue that while demographic representation is a necessary condition, it does not automatically result in equitable governance. Rather, organizational context, discretion levels, and structural power relations shape whether passive representation translates into meaningful policy influence. This perspective challenges superficial diversity metrics and shifts the analytical focus toward structural and institutional enablers of inclusion.

The utility of representative bureaucracy theory lies in its normative and instrumental dimensions. Normatively, it is rooted in democratic ideals—suggesting that a public service that reflects the society it serves enhances legitimacy, fairness, and responsiveness (Riccucci, 2021). Instrumentally, studies have shown that representative bureaucracies can better address the needs of marginalized groups, foster trust, and improve service outcomes, particularly in sectors such as education, health, and welfare (Keiser et al., 2002; Meier & Bohte, 2007).

Over time, the theory has evolved to incorporate intersectional and institutional critiques. Scholars have highlighted that traditional models often understate the role of organizational culture, gendered power dynamics, and implicit bias in limiting women's influence, even in diverse bureaucracies (Kanter, 1977; McCandless et al., 2022). Contemporary interpretations, therefore, expand the framework to consider not only who is represented, but also how they are positioned within bureaucratic hierarchies and whether institutional norms permit genuine agency. In this regard, Dahlerup's (2006) critical mass theory further argues that numerical representation alone is insufficient to drive substantive change, unless women's presence reaches a threshold that shifts power dynamics.

The following section explores how structural and institutional characteristics of public organizations continue to restrict gender representative ideals in practice, despite normative support.

2.3.2 Structural Constraints and Institutional Limitations to Gender Representation in the Public Sector

Despite normative support for gender equality in public institutions, structural and institutional conditions often restrict the realization of meaningful gender representation. While representative bureaucracy theory highlights the importance of demographic similarity and the potential for active representation, these ideals are frequently undermined by long-standing bureaucratic norms and practices. This section outlines three key categories of constraints that hinder women's representation in the public sector: institutional rigidity and recruitment logic, symbolic or insufficient inclusion, and the gap between DEI commitments and their implementation.

A primary constraint lies in the bureaucratic structure of public administration itself. Although bureaucracies are traditionally built on principles of neutrality, meritocracy, and seniority, research has shown that these seemingly gender-neutral values often

reproduce exclusionary patterns in practice (Acker, 1990; Acker, 2006). Olsen (2008) similarly emphasizes that the rule-bound and hierarchical nature of public institutions discourages flexibility and innovation in organizational functioning. These features tend to privilege standardized career paths and long tenures, which may not align with the diverse life experiences and professional trajectories of women (Acker, 1990; Acker, 2006). McCandless et al. (2022) further highlight how these institutional arrangements create resistance to organizational change, leading to what they term an "implementation gap" between DEI aspirations and outcomes. In such settings, even well-designed inclusion policies may struggle to take root if they conflict with the deep-seated logic of bureaucratic functioning.

Beyond structural rigidity, the limited number of women in leadership or strategic positions often results in symbolic inclusion rather than substantive influence. Kanter's (1977) theory of tokenism suggests that when women constitute a small minority in an organization, they may be treated as symbolic representatives, lacking real power or voice. This phenomenon persists even in gender-balanced workplaces if women remain excluded from key decision-making networks. Dahlerup's (2006) critical mass theory builds on this notion, arguing that unless women's representation surpasses a certain threshold, their presence alone will not lead to meaningful institutional transformation. Tremblay (2006) adds that under such circumstances, women may act as "surrogates," occupying visible roles without having the authority or autonomy to advance gender-related interests. These theories underline how mere demographic representation, particularly when numerically minimal, fails to challenge existing power structures.

The limitations of representation are further exacerbated by the disconnection between DEI commitments and their implementation. McCandless et al. (2022) emphasize the "implementation gap," where diversity frameworks exist formally but are inconsistently embedded in organizational practices. As a result, DEI policies may exist largely as formalities, lacking the procedural follow-through necessary to affect

recruitment, promotion, and organizational culture. Riccucci and Van Ryzin (2017) similarly warn that passive representation alone—without enabling conditions such as discretion, resources, and institutional support—does not necessarily increase public trust or improve service equity. This policy–practice gap reflects a broader tension within public bureaucracies: the existence of normative goals on paper, but insufficient structural mechanisms to actualize them.

In sum, while gender equality may be a stated goal in many public organizations, institutional structures often reproduce patterns of exclusion and under-representation. Whether through rigid recruitment systems, symbolic inclusion, or weak policy enforcement, these barriers collectively restrict the transformation of passive representation into active influence. Recognizing and addressing these institutional limitations is therefore essential to making gender DEI efforts more than symbolic gestures.

2.3.3 Gender Representation and Public Sector Performance

As public institutions seek to enhance equity and accountability, increasing attention has been paid to whether gender representation contributes not only to fairness but also to organizational performance. A growing body of literature within the representative bureaucracy tradition has explored how the presence of women in public sector roles—particularly in decision-making capacities—can improve outcomes across a range of governance areas, including responsiveness, service equity, and citizen trust.

Empirical research provides considerable evidence for the link between gender representation and improved performance. Keiser et al. (2002), examining U.S. administrative data, find that gender-matched bureaucrats are more likely to advocate for and deliver services responsive to women's needs, particularly in domains such as education and health. Similarly, Meier and Nicholson-Crotty (2006) demonstrate that the presence of female officers in law enforcement correlates with more sensitive

handling of gender-based violence cases. These studies suggest that when women occupy roles with policy discretion, they are more likely to engage in active representation—advancing the interests of those they share social identities with.

This relationship is also evident in broader institutional effects. Selden (1997) argues that representative bureaucracies are better equipped to recognize and address the differential needs of diverse populations, leading to more equitable service delivery. Riccucci (2021) further emphasizes the normative role of gender representation in reinforcing democratic legitimacy. When citizens perceive that public institutions reflect the diversity of the society they serve, trust in those institutions tends to increase. This is particularly salient in gender-sensitive areas such as reproductive health, social welfare, and education, where women's voices in policy design and implementation have been shown to enhance relevance and accessibility.

However, the performance benefits of representation are not automatic. As Riccucci and Van Ryzin (2017) caution, passive representation does not guarantee improved outcomes unless bureaucrats are granted the discretion and institutional support necessary to act upon their representative identities. Meier and Bohte (2007) similarly argue that the effect of representation on performance is conditional on organizational structures, task complexity, and policy salience. In rigid or highly rule-bound environments—common in many public bureaucracies—efforts at active representation may be constrained by a lack of authority or fear of institutional pushback.

While gender representation in the public sector does not automatically translate into enhanced performance, substantial evidence suggests that under the right conditions, it contributes to more equitable, responsive, and legitimate public services. These findings highlight the importance of not only increasing women's numerical presence in public administration but also ensuring that institutional environments enable their substantive participation.

2.4 Intersection of Gender, ICT, and the Public Sector: Toward an Analytical Framework

While each of the preceding sections has examined diversity, equity, and inclusion (DEI) within a distinct domain—gender, ICT professions, and the public sector—meaningful analysis requires understanding how these domains intersect. Women working in technical roles within public institutions experience not only the general structural and cultural barriers associated with gender, but also challenges specific to highly institutionalized environments and male-dominated professional fields. This intersection produces a layered set of constraints that cannot be fully understood through single-axis analysis.

The intersection of gender, ICT, and public bureaucracy presents a uniquely complex environment. ICT occupations are often characterized by masculine professional norms, expectations of brilliance, and individualism (Cheryan et al., 2017; Ashcraft et al., 2016). These norms can alienate women from informal networks, limit recognition of their expertise, and devalue collaborative or non-linear career trajectories. Within public organizations, these challenges are compounded by bureaucratic rigidity, seniority-based advancement, and procedural cultures that resist rapid transformation (McCandless et al., 2022). As a result, women in ICT roles in public institutions may face both horizontal exclusion (limited entry) and vertical stagnation (limited advancement), often without access to the discretionary authority needed to act as active representatives.

To better conceptualize this intersectional landscape, three analytical dimensions are proposed: institutional structure, organizational culture, and representational agency.

> *Institutional structure* refers to formal recruitment, promotion, and role classification systems that affect women's access to and mobility within public ICT positions.

Organizational culture captures both visible and invisible norms—such as assumptions about merit, technical competence, and leadership styles—that shape inclusion or exclusion.

Representational agency focuses on the degree to which women are empowered, supported, and authorized to act on behalf of their identities and constituencies.

Table 1 illustrates the conceptual intersection of gender, ICT, and the public sector across these dimensions.In addition, each dimension suggests potential areas of inquiry that will inform the design of interview protocols in the empirical section of this study.

Table 1. Analytical Framework for Examining Gender, ICT, and Public Sector Intersections

Dimension	Gender	ICT Sector	Public Sector	Interview Focus
Institutional Structure	Occupational segregation; career discontinuity	under-representation; male-dominated hierarchies	Rule-based systems; rigid promotion pathways	Requirement,Evaluation, Promotion,Rights and Responsibilities
Organizational Culture	Gendered norms; informal exclusion	Brilliance bias; valorization of individualism	Neutrality myths; resistance to change	Norms, Stereotypes,Expectations, Perceived Competence

Dimension	Gender	ICT Sector	Public Sector	Interview Focus
Representational Agency	Limited decision-making power; lack of allies	Tokenism; constrained influence	Symbolic inclusion; limited policy discretion	Voice, Legitimacy, Policy Influence

Source: Developed by the author

This framework serves as an interpretive lens for analyzing how multiple systems of power interact to shape the experiences of women in public sector ICT roles. Rather than offering causal explanations, it highlights the layered institutional and cultural mechanisms that must be considered when evaluating DEI initiatives. It also informs the empirical analysis that follows in Chapter 4, where the presence, positioning, and influence of women in Estonian public ICT institutions are examined through these dimensions

3. Methodology

This thesis presents a country-level qualitative case study of ICT professionals in Estonia's public sector, aiming to explore gender diversity, equity, and inclusion (DEI) across multiple institutional and organizational settings. Combining empirical and documentary data, the research integrates in-depth interviews with ten professionals from six ICT-focused public agencies, along with a systematic review of institutional reports, organizational websites, and national statistics. This design allows for a multi-layered understanding of how institutional structures, organizational cultures, and representational dynamics shape women's experiences in the Estonian context.

Given the study's emphasis on lived experiences, perceptions of inclusion, and organizational norms, qualitative interviews were selected as the primary data collection method to access context-specific narratives and complex social meanings.

As Kvale and Brinkmann (2009) argue, qualitative interviews are particularly effective in capturing participants' meaning-making processes within their social environments. Similarly, Seidman (2013) underscores that in-depth interviews offer a means to link personal trajectories with broader policy and institutional frameworks—making them especially suitable for research on professional identities and organizational inclusion.

To complement the interview data, structural and statistical information was also collected to contextualize and triangulate the findings. The integration of empirical narratives with secondary data and theoretical literature—outlined in Chapter 2—ensures a comprehensive and grounded approach to understanding the studied phenomenon.

3.1 Selected Public Sector ICT Agencies

Rather than focusing on a single institutional case, this study engages with multiple public sector ICT agencies in Estonia to investigate how diversity, equity, and inclusion (DEI) are experienced and shaped across varied institutional contexts. While the design does not follow a comparative multi-case study in the strict methodological sense, the selected agencies vary significantly in terms of size, function, governance structure, and gender composition. These variations enabled the identification of patterns and divergent perspectives, which are further explored in the findings and discussion chapters.

The six agencies were purposefully selected based on their strategic relevance to Estonia’s digital governance ecosystem. While five of these are governmental institutions operating under various ministries or state authorities, the e-Governance Academy (EGA) is a non-profit foundation. Despite its independent legal status, EGA is co-funded by the Estonian Government, the UNDP, and the Open Society Institute, and collaborates closely with public sector bodies both domestically and

internationally. Its inclusion reflects its unique position at the intersection of digital public services, policy advisory, and international capacity-building.

The rationale for selecting each agency lies in its central role in state-level ICT systems, as well as the opportunity it offers to examine gender and inclusion dynamics across different types of institutional settings. Table 2 summarizes the selected agencies, their Estonian and English names, and their relevance to this research.

Table 2. Selected Agencies and Their Relevance to the Research

Abbreviation	Estonian Name	English Name	Reason for Selection
RIA	Riigi Infosüsteemi Amet	Information System Authority	Core actor in national cybersecurity and e-ID infrastructure,Oversees e-governance platforms. Ideal for studying women's roles in critical technological fields.
RIK	Registrite ja Infosüsteemide Keskus	Centre of Registers and Information Systems	Major public ICT agency with large workforce; RIK develops and manages key e-government platforms to support digital transformation in justice, business, and public services.
TEHIK	Tervise ja Heaolu Infosüsteemide Keskus	Health and Welfare Information Systems Centre	Manages ICT systems for health and welfare, offering insights into women's opportunities in socially focused ICT fields.

Abbreviation	Estonian Name	English Name	Reason for Selection
AKI	Andmekaitse Inspektsioon	Data Protection Inspectorate	Estonia's national data protection authority,It enforces GDPR and national data protection laws; Handling data breach reports and complaints; Small-sized regulator with female-dominant staff structure
RMIT	Rahandusministeeriumi Infotehnoloogiakeskus	IT Centre of the Ministry of Finance	Responsible for providing, managing, and securing digital solutions for the Ministry of Finance and its subordinate institutions. RMIT ensures the efficient and secure operation of critical public sector information systems, including tax administration, statistical data processing, anti-money laundering systems, and national financial management.
EGA	E-riigi Akadeemia	e-Governance Academy	Public-sector–affiliated,non-profit foundation that assists public sector institutions worldwide in digital transformation, co-founded by the Estonian Government, Open Society Institute (OSI), and UNDP;

Source: Developed by the author

3.2 Data Collection

Interviews

Ten respondents participated in the study, including nine oral interviews and one written response via email. Interviews lasted between 55 and 80 minutes, with an average duration of approximately 65 minutes. A set of 10–15 main questions was used, with slight modifications based on the interviewee's expertise, background, and role. For instance, senior professionals in director-level positions were invited to reflect on representational bureaucracy, leadership, and decision-making, while interviews with HR managers focused more on recruitment, promotion, pay gaps, and internal or national DEI initiatives.

Despite efforts to include a broader gender representation, no male participants agreed to participate in oral interviews; only one male professional responded via email. Some questions—such as those related to the "glass cliff" phenomenon—were removed or revised when no clear tendencies were identified during earlier interviews.

Almost all interview questions were developed based on the analytical framework introduced in Chapter 2. The interviews covered themes related to gendered professional experiences, institutional practices, and policy environments, structured around three core dimensions: institutional structure (e.g., recruitment, promotion, pay, and mobility), organizational culture (e.g., stereotypes, gendered roles, communication norms, and perceptions of competence), and representational agency (e.g., women's participation in decision-making, professional visibility, and legitimacy of voice).

The interviews generated over 150 pages of transcribed material. By the eighth and ninth interviews, thematic saturation had largely been reached, with recurring patterns and few new themes emerging—indicating sufficient data depth and content richness for robust qualitative analysis.

In addition to the primary interview data, relevant secondary sources were used to contextualize the findings and support interpretation. These included organizational websites, national statistics, institutional reports, and EU-level policy documents. Empirical background data—such as agency size and gender composition—were collected from public sources and, where possible, through direct communication with HR departments. The literature reviewed in Chapter 2 also played a critical role in forming the analytical framework and guiding the coding process.

Participant Background and Diversity

The interviewees represented a highly diverse sample in terms of age, experience, professional background, and institutional roles. Their years of experience in the ICT and public administration fields ranged from three years as a recent graduate in their twenties to almost three decades of experience, reflecting a broad career spectrum from early-career professionals to senior-level experts. Participants held roles such as programmers, data analysts, product owners, department heads, directors, HR executives, and advisor to the Estonian President, indicating diversity not only in seniority but also in function and specialization.

Professionally, the interviewees came from a wide array of domains, including legal, technical, statistical, and policy-related work, and some had actively contributed to both national and international projects. Their areas of involvement included cybersecurity, e-ID development, GDPR implementation, data interoperability initiatives, city service design, internal staffing regulations, and EU digital governance strategies. Some respondents also had prior experience in academia (e.g., Tallinn University of Technology) or the private sector.

Institutionally, the participants had experience working in or closely with a broad range of public entities,and across various government ministries and administrative levels such as the Ministry of Finance, Ministry of Social Affairs, Ministry of Education, city-level digital service units, and the European Commission,OECD and

some multilateral organizations. Collectively, they provided deep and multi-layered insights into Estonia's public sector ICT ecosystem. This institutional and thematic diversity ensured that the data captured a wide range of perspectives on gender, diversity, equity and inclusion, and institutional and cultural dimensions in different contexts.

Participant Grouping and Rationale

For analytical purposes, participants were grouped by years of experience and career stage into two categories, as shown in Table 3. The *junior and mid-level group* includes professionals with approximately 3 to 13 years of experience, typically in non-executive roles such as specialists, team members, or mid-level managers. The *highly senior group* consists of participants with more than 20 years of experience, most of whom held senior expert or leadership positions within their organizations.

Participants with 3–5 years (junior) and 6–13 years (mid-level) of experience were merged into a single group due to the small number of junior participants and the similarity in their organizational positions and career trajectories. Although one participant fell within the 13–19 years range (19 years), they were included in the highly senior group based on their responsibilities and role as a top-level decision-maker.

Male professionals were not analyzed as a separate group, both because the research primarily focuses on female professionals' experiences and male representation in the sample was limited. Due to privacy considerations and to prevent potential identification, the specific agencies to which each participant belongs are not disclosed.

Table 3. Participant Grouping by Years of Experience

Participant ID	Years of Experience in the Field	Group Category
P1	3-13	Junior and Mid Level
P2	3-13	Junior and Mid Level
P3	3-13	Junior and Mid Level
P4	3-13	Junior and Mid Level
P5	20+	Highly Senior
P6	20+	Highly Senior
P7	20+	Highly Senior
P8	20+	Highly Senior
P9	20+	Highly Senior
P10	20+	Highly Senior

Source: Developed by the author

3.3 Data Analysis

All interviews were transcribed, cleared, and prepared for qualitative analysis. The data were manually coded using Microsoft Excel, enabling a transparent and iterative process of organizing and classifying responses. Each response was analyzed thoroughly across multiple relevant categories—for example, a single statement could be coded under both "organizational culture" and "representational agency" when relevant points were identified and where applicable. This cross-dimensional approach allowed for the identification of nuanced patterns embedded within participants' narratives.

The analytical framework introduced in Chapter 2 served as the guiding structure for the coding and thematic analysis. It comprises three main dimensions:

Institutional Structure: Recruitment, promotion, pay, and career mobility;

Organizational Culture: Stereotypes, gendered expectations, leadership styles, communication norms;

Representational Agency: Women's visibility in decision-making, legitimacy, and symbolic vs. substantive representation.

Each interview transcript was systematically examined along these dimensions. Key themes were consolidated into thematic clusters, which formed the foundation of the findings chapter (Chapter 4). The coding scheme remained flexible and was refined during the process in response to emergent patterns and recurring themes.

In addition to the primary interview data, the analysis was supported by a range of secondary sources, including institutional websites, organizational documents, national gender equality reports, and EU-level policy texts. These materials provided essential context for understanding organizational structures and sector-wide practices.For instance, gender ratio data across the six agencies were primarily obtained through direct requests to institutional representatives, including HR departments. These figures were not always publicly available and were specifically collected for this study. Notable patterns—such as a significantly higher proportion of women in agencies like AKI and TEHIK—were identified and then brought into interviews or follow-up communications for clarification. In some cases, participants attributed the higher proportion of women to the perception of these agencies offering more "soft" or support-oriented roles.

Finally, the literature reviewed in Chapter 2 played a critical role in forming the analytical categories and informing interpretation. Theoretical contributions on gendered institutions, organizational logics, and inclusive representation helped anchor the findings in a broader academic discourse and ensured coherence between data and conceptual framing.

4. Empirical Study on Public sector ICT domain in Estonia

4.1 Empirical Evidence Based on Structural and Statistical Data

Estonia has made great strides towards gender equality. Girls today outperform boys in educational attainment, but they are less likely than boys to study mathematics or information and communication technology (ICT). The gender employment gap is small, yet Estonian women are still less likely to make it to the top. Career breaks around childbirth contribute to the declining but still considerable gender wage gap (OECD, 2022).

This general picture is also reflected in Estonia's public sector and ICT workforce, where women remain underrepresented in technical roles despite notable progress in leadership positions. This section explores the current status of gender representation in ICT-related roles within Estonia's public sector, drawing on available statistical sources and qualitative evidence.

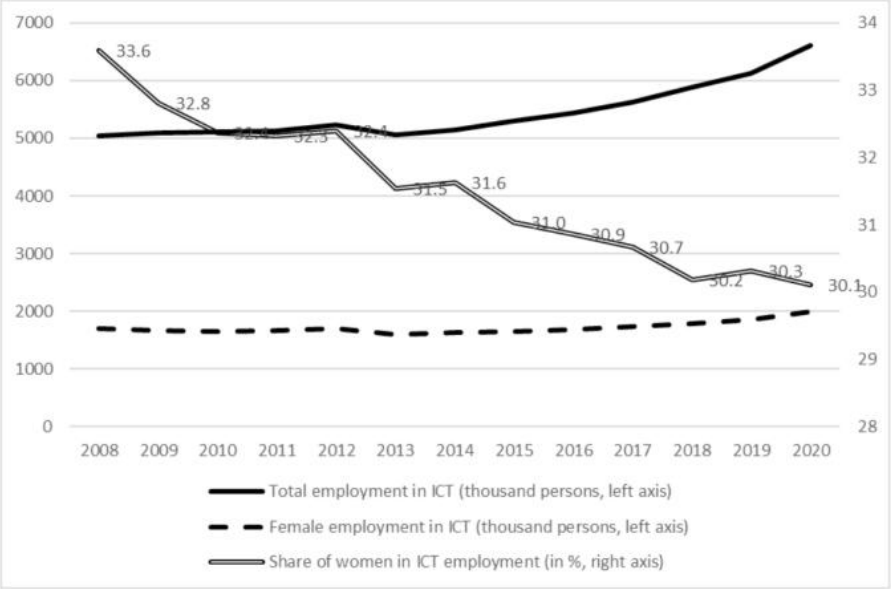
4.1.1 Gender Representation in the ICT Domain within EU and Estonian context

To contextualize the national case of Estonia, it is essential to understand broader gender dynamics in the ICT sector across the European Union. This section offers a brief comparative overview to illustrate where Estonia stands relative to other EU countries, and to frame the national findings within wider regional trends.

Gender disparities in the ICT sector persist across the EU. Women remain underrepresented in ICT-related education, employment, and leadership positions, despite ongoing policy efforts and increased attention to gender equality (European Commission, 2023; European Institute for Gender Equality, 2022; Eurostat, 2022). According to the European Commission's 2023 Digital Decade Country Report, only 18.9% of ICT specialists across the EU are women—a figure that remains disproportionately low compared to other sectors. Additionally, a significant gender

pay gap continues to limit women's progression in the field, with women earning notably less than their male counterparts.

Figure 1. Employment in the ICT Sector in the 27 European Union Countries in the Years 2008–2020



Source: Retrieved from *Women in the ICT Sector in European Union States: Facing Gender Inequalities* (p. 17), by Gaweł, A., & Kapsdorferová, Z. (2024).

Figure 1 highlights a slight decline in the percentage of women employed in ICT roles across the EU from 33.6% in 2008 to 30.1% in 2020, showcasing the gender gap that continues to persist despite efforts to close it (Gaweł & Kapsdorferová, 2024).

As shown in the Table 4, In contrast to the EU average, Estonia has made some strides in addressing gender disparities in ICT. According to the Estonia 2024 Digital Decade Country Report, 26.8% of ICT specialists in Estonia are women, the second-highest percentage in the EU, though still below the 50% gender parity seen in some sectors.

Table 4. Gender Representation in Estonia's ICT Sector Compared to the EU Average

Indicator	Estonia	EU Average
Percentage of Female ICT Specialists	26.8%	18.9%
Percentage of Female ICT Graduates	27%	24.9%
Gender Wage Gap in ICT	16.8%	N/A

Source: Developed by the author based on data from European Commission. (2023). *Estonia 2024 Digital Decade Country Report*.

4.1.2 Gender Representation in the Selected ICT Agencies of This Study

This section provides an overview of the gender composition in the six Estonian public sector ICT agencies selected for this study. As discussed in the methodology chapter, these agencies were purposefully chosen due to their relevance to Estonia's digital governance ecosystem and their diverse organizational profiles. Since these agencies vary significantly in size—ranging from fewer than 30 employees (e.g., the Data Protection Inspectorate) to over 300 (e.g., RIK)—as well as in their internal departmental structures and management hierarchies, it was necessary to contextualize each one individually.

Moreover, because most gender-disaggregated data on staff and leadership composition were not publicly available or updated, the majority of figures presented in this section were collected by the author by directly reaching out to the organizations' HR departments between April and May 2025. with support from interview participants. Exceptions include the EGA (e-Governance Academy) and RMIT (Information Technology Center of the Ministry of Finance of Estonia), for which data were retrieved from public sources due to the lack of response from HR personnel.

The Information System Authority (RIA), one of Estonia's largest public ICT agencies reported a total of 161 employees as of May 2024. According to its HR department, approximately 58% of staff are men and 42% are women. However, at the managerial level—defined as including department heads, team leads, and executive management—the share of women drops to 31%, with men occupying 69% of leadership roles (RIA HR, personal communication, May 2025).

Based on Figure 2 provided by RIK's Human Resources Department (personal communication, May 2025), the Centre of Registers and Information Systems (RIK) maintains a relatively gender-balanced workforce overall. As of May 2025, RIK employed 281 people, including 148 men (47.3%) and 133 women (52.7%). The organization has one director (male) and one deputy director (female) in the field of service development, while no deputy directors are currently assigned to the strategy and organizational development area.

Among the 27 team leaders across RIK, 14 are women. In the development area specifically, 7 of the 18 team leaders are female. In the strategy and organizational development department, leadership roles are more evenly distributed, with 7 female and 3 male team leaders. These figures, as illustrated in Figure 2 indicate that while the general workforce reflects gender parity, leadership remains somewhat male-dominated in certain technical departments.

Figure 2: Gender Distribution by Department and Job Function at the Centre of Registers and Information Systems (RIK)

Source: RIK internal dashboard, May 2025; data obtained by the author through direct communication with the RIK HR team. This internal data is used exclusively for the purposes of this research.

The Health and Welfare Information Systems Centre (TEHIK) employs a total of 220 staff members as of early June 2025, with women making up 52.27% (115) of the workforce and men 47.73% (105). Among the 32 individuals in leadership positions, 20 are women and 12 are men, meaning women represent 62.5% of management roles, including two department heads, while men hold the position of director and three department head positions. This indicates a relatively strong representation of women not only in the general workforce but also at the leadership level, although the highest executive position is held by a man. These figures were obtained directly from the TEHIK HR department (Personal communication, May 2025), as no public documents or web sources are currently available.

The Estonian Data Protection Inspectorate (AKI) operates with a total of 33 staff positions as of April 2025, including 29 civil servant roles and 3 contract-based positions, according to the official structure outlined in Executive Order No. 1.1.-4/25/7 (ADR, 2025). Among these, 31 positions are held by women and only 2

by men. Leadership is also predominantly female: out of the five top managerial positions—comprising the Director General and four department heads—four are currently held by women (Personal communication, April 2025). This gender imbalance, as one participant from the agency explained, is largely because of the nature of AKI's work: "We have a lot of lawyers — almost 20 people are lawyers — so maybe that explains it". While the agency does have a dedicated technology department, it consists of only two individuals:

The Information Technology Centre of the Ministry of Finance (RMIT) is an Estonian government agency, established in 2012, that provides ICT services to the Ministry of Finance, Tax and Customs Board, Statistics Estonia, and related institutions. According to Storybook.ee, a business information and registry aggregation platform, RMIT employed approximately 193 staff as of the first quarter of 2025—though LinkedIn suggests around 180 employees, indicating minor reporting differences. No publicly available information could be found regarding the gender distribution of either its general workforce or leadership

The e-Governance Academy (EGA) is a public-sector–affiliated non-profit organization,the organization reports having over 100 team members across eight locations (e-Governance Academy, n.d.-a). While its website and annual reports reflect growth in staff size over the past few years, detailed demographic data such as the gender distribution of its workforce or leadership is not publicly available. Multiple attempts to obtain this information directly from the organization were unsuccessful.

To summarize the institutional patterns described above, Table 5 presents a comparative overview of the gender distribution across the six selected ICT agencies, including both overall staff composition and management-level representation. While some institutions exhibit near parity or female-majority staffing, leadership positions often remain disproportionately occupied by men. In cases such as RMIT and EGA, public access to gender-disaggregated data remains limited.

Table 5. Gender Distribution in Selected Estonian Public Sector ICT Agencies

Agency	Total Employees	Women	Men	Women in Mgmt	Men in Mgmt	Source
RIA	161	68(42%)	93 (58%)	6 (31%)	14 (69%)	HR communication
RIK	338	171 (50.6%)	167 (49.4%)	9 (25%)	27 (75%)	HR communication
TEHIK	220	115 (52.3%)	105 (47.7%)	20 (62.5%)	12 (37.5%)	HR communication
AKI	33	31 (94%)	2 (6%)	4 (80%)	1 (20%)	HR communication
RMIT	193	n/a	n/a	n/a	n/a	Storybook.ee
EGA	~100	n/a	n/a	n/a	n/a	ega.ee

Source: Developed by the author based on data from from HR correspondence and publicly available information, April–May 2025.

4.1.3 Gender Pay Gap in Estonia: Trends, Causes, and Policy Response

Estonia has long been noted for having one of the widest gender pay gaps (GPG) in the European Union. In 2013, the unadjusted GPG stood at 29.8%, and although it declined to 16.9% by 2023—representing the most substantial improvement among EU member states—it remains among the highest in the region (Eurostat, 2025)[1].

[1] *Statistics Estonia and Eurostat use different methodologies to calculate the gender pay gap. The gender pay gap published by Eurostat does not take into account the indicators of enterprises and institutions with fewer than 10 employees; it also excludes the earnings of employees in agriculture, forestry and fishing and in public administration and defence.*

According to Statistics Estonia (2025), the national average GPG in 2024 was 13.2%[2], with marked sectoral variation: in the information and communication sector, the gap reached 24.4%, while it was just 6.5% in public administration and defence.

Despite the notable decline, discrepancies exist in how Estonia's ranking is reported across different sources. While some sources continue to cite Estonia as having the largest GPG in the Union (Anspal, 2015; ERR News, 2025; The European Correspondent, 2025), more recent data from the European Parliament (2025) suggest that Latvia, Austria, and Czechia may now surpass Estonia. Such discrepancies are largely due to differences in data collection methods, sectoral coverage, and timeframes. As such, the interpretation of GPG figures requires methodological caution.

The persistence of the pay gap in Estonia has been the subject of multiple empirical studies. A study by Meriküll and Rõõm (2023), based on longitudinal administrative data from 1989 to 2020, found that the raw gender wage gap in Estonia was as high as 41% in 1989. The gap dropped sharply to below 30% by 1992 following the transition to a market economy, but the unexplained portion of the gap remained persistently high—ranging between 25% and 30% for much of the subsequent decades.However, their analysis found that a significant portion of the wage gap remains unexplained even after accounting for factors such as education, sector, and experience. They argue that the legacy of the Soviet system—characterized by high female labor force participation but strong occupational segregation—continues to shape labor market structures and gendered wage outcomes in the post-transition economy.

Additional insights come from the REGE project ("Reducing the Gender Wage Gap") led by Tallinn University, which concluded in 2022. The project marked a significant advancement in understanding the pay gap by explaining approximately 40% of

2 The 2024 gender pay gap data were collected using the Statistics Estonia questionnaire "Gross hourly earnings of male and female employees in October", and the calculation is based on gross hourly wages excluding irregular bonuses or premiums.

it—more than double the proportion previously accounted for in earlier studies. According to the findings, the gender wage gap in Estonia is largely driven by labour market segregation, specifically differences in occupation, economic sector, educational attainment, and the ownership structure of firms—particularly the dominance of highly paid male employees in foreign-owned companies. However, a considerable portion of the gap remains unexplained, especially in the upper end of the income distribution. The persistence of the pay gap is further reinforced by entrenched stereotypes, unconscious biases, and misconceptions—such as the belief that individual employers cannot affect pay levels determined by the market. Recent decreases in the pay gap have been partly attributed to rising minimum wages and increased public sector salaries in education, healthcare, and culture.

Several other studies have investigated possible cultural and behavioral factors. For example, van der Velde et al. (2015) examined whether gendered linguistic patterns could explain variations in pay gaps across countries. While Estonian is considered a relatively gender-neutral language, their findings suggest that linguistic neutrality alone does not guarantee wage equality. Meanwhile, Hein, Hazak, and Männasoo (2017) focused on creative R&D workers and observed that women in high-skilled roles were less likely to access the highest-paying positions, even after controlling for qualifications and experience.

To address these disparities, Estonia is preparing to implement the European Union's Pay Transparency Directive, adopted in April 2023 and set to come into effect nationally in 2026. The directive mandates that companies with over 100 employees disclose their gender pay gap data and justify any unexplained disparities exceeding 5%. Approximately 889 organizations in Estonia—192 of which are public institutions—will be subject to the reporting requirements (Ministry of Economic Affairs and Communications, 2025). To support this transition, the Estonian government is developing a digital platform, *Palgapeegel* ("Pay Mirror"), which will

facilitate automated GPG analysis and promote transparency in wage-setting practices.

As Eva Liina Kliiman, advisor at the Ministry of Economic Affairs and Communications, noted: "The gender pay gap is an indicator of overall gender equality in society." She emphasized that income disparities have tangible long-term effects, including on social benefits and pension rights (Statistics Estonia, 2025). Additionally, symbolic initiatives such as Estonia's Equal Pay Day—marked in 2024 with the statement that "a woman has to work 33 days more to earn the same as a man"—highlight both progress and persisting inequality (ERR News, 2025).

4.2 Findings Based on Primary Data

This section presents empirical findings derived from in-depth qualitative interviews with ten ICT professionals working in Estonia's public sector. Their narratives offer a grounded understanding of how institutional norms, organizational dynamics, and representational factors shape women's experiences in the field. These findings expand upon the theoretical and contextual insights discussed in earlier chapters and provide first-hand perspectives on challenges and enablers related to gender diversity, equity, and inclusion (DEI) in government ICT roles.

Following the analytical framework established in Chapter 2.4, the analysis is structured around three interrelated dimensions: institutional structure, organizational culture, and representational agency. Each dimension corresponds to a distinct layer of systemic influence—ranging from formal procedures and career pathways to daily workplace norms and the visibility of women in decision-making spaces.

4.2.1 Institutional Structure: Entry, Mobility, and Advancement

This dimension examines how formal structures—such as recruitment procedures, promotion practices, employment regulations, and career progression systems—affect women's access to and movement within public sector ICT roles. Although many

participants reported that recruitment and promotion frameworks appear gender-neutral on the surface, their accounts reveal deeper tensions. These include the internalization of higher performance standards by women, disparities in confidence and self-promotion, and organizational assumptions about caregiving responsibilities. Together, these factors suggest that the institutional structure, while formally equal, may not always function equitably in practice.

4.2.1.1 Requirement,Evaluation, Promotion, Equal Rights and Responsibilities

Recruitment procedures were widely described as officially gender-neutral. Assessments were generally based on performance, qualifications, and team compatibility rather than gender (P1; P9; P10). However, gendered outcomes still emerged. Technical roles received significantly more applications from men, while non-technical roles showed more gender balance (P2). In particularly difficult-to-fill positions, some hiring managers had to rely on their personal networks to recruit candidates (P9), which potentially limits diversity. Events in technical fields like cybersecurity often had only one or two women present, reflecting continued (P1).

Limited early exposure to ICT career paths was also considered a barrier for women. As one participant noted, "variety of choices are not well explained," especially for young people entering the field (P4). Some participants suggested that persistent male dominance in advanced technical roles was due in part to men having historically more exposure and experience in these areas (P3).

Evaluation and promotion processes were viewed as formally fair, but unequal self-perception and internal expectations played a role in career progression. Many participants observed that women tend to prepare more thoroughly, hold themselves to higher standards, and often hesitate to apply for promotions unless they feel fully qualified (P4; P5; P6). As one participant reflected, "I was crying all the time last summer" from the pressure she put on herself to succeed as a young female team lead (P4). Another noted that women are"working harder, preparing more

comprehensively, sometimes even working too much" which can contribute to burnout and hesitation in applying for leadership roles (P5). In contrast, male colleagues were often described as more relaxed and more likely to step forward confidently—even when less prepared (P4; P7).

Several participants pointed out that communication style and self-presentation can influence outcomes. Women were seen as more verbally expressive and structurally detailed in interviews (P6), sometimes interpreted as more motivated or demanding. Others, however, noted that women can be more objective and modest about their achievements, which may affect perceptions during evaluations (P6; P7).

Caregiving responsibilities were consistently mentioned as structural factors impacting women's advancement. One HR executive shared that while remote work was now accepted, leadership positions often required physical presence—creating challenges for parents, especially mothers (P6). Women with small children were more likely to take sick leave or feel emotionally affected when balancing childcare and work responsibilities. One participant summarized: "When people have small children, it's often the women who have to deal with more problems… they can be more fragile during that period" (P8). Even with institutional support, women often felt overwhelmed by multitasking and household duties (P6). Gendered assumptions during recruitment were also noted. One participant recalled that in her previous organization, women in their 20s were sometimes avoided during hiring processes due to concerns about potential pregnancy (P9).

While many participants reported equal rights, responsibilities, and benefits in their current organizations, others highlighted unequal experiences in practice. One participant stated, "Yes. When they have already started their career, there's no difference in how they can grow or take responsibilities" (P8). Yet others noted a gap in encouragement—women sometimes need a push to pursue promotions, whereas men more readily volunteer themselves (P7). This mindset, some suggested, limits women's progression even within supportive environments.

Leadership diversity also appeared uneven. Although some organizations had strong female representation in middle management, top leadership remained male-dominated (P2). One participant observed that leadership gender often reflected team composition, suggesting that diversity—or its absence—can become self-reinforcing (P2).

This aligns with another case described by a participant：

> *There was one budget manager who had the ambition to become a team leader. She didn't make it. In the decision-making team, there were a total of eight people — seven men and one woman. At the management level, they said she didn't have good interpersonal skills. But they didn't even give her a chance to attend the competition. (P6)*

where a budget manager with aspirations to become a team leader was denied the opportunity due to perceived shortcomings in interpersonal skills—without being given a chance to demonstrate her capabilities (P9). As she put it, "They didn't even give her a chance... at least they should have let her try."

Non-linear career paths and internal mobility were also discussed by several participants. Some had entered ICT roles from non-technical backgrounds, highlighting transferable skills such as logical thinking, communication, and a strong willingness to learn. For example, one participant (P1) shared that she transitioned into a technical position after expressing interest, writing a simple motivation letter, and applying informally. To her surprise, she was the only applicant for the role, and the process was quick and straightforward. Similarly, another participant (P8) mentioned that some of her colleagues had previously worked at Burger King, before deciding to move into the IT field. They took night classes and followed online tutorials, eventually being recruited into her team. Finally, the question of visible leadership remains open. While some organizations showed growing gender diversity among mid-level leadership, top leadership roles still skewed male (P2;P4).

In summary, while recruitment and promotion in Estonia's public sector ICT are governed by formally neutral policies, unequal outcomes persist due to a range of structural and socio-cultural factors. These include disproportionate caregiving responsibilities—such as childrearing, elder care, and the implications of pregnancy and maternity leave—which often fall on women. Additionally, male-dominated leadership structures and potential biases in hiring, evaluation, and promotion processes further reinforce unequal access to advancement.

4.2.1.2 Gender Pay Gap

Although most participants affirmed that their organizations formally uphold equal pay for equal work, interview responses revealed subtle but persistent gaps in salary and career stability. These disparities appear to be shaped by a combination of care-giving responsibilities, role distribution, confidence in negotiation, and pay transparency.

Firstly, several participants stressed that their organizations use structured systems to ensure fairness. "When we hire someone, no matter whether it's a man or a woman, the salary will be the same," (P6). Public sector institutions often rely on job classification systems and salary bands, which define pay ranges based on experience or job group rather than individual negotiation (P3; P4; P7). However, participants also pointed out that not all contracts fall under the same framework—some employees are public servants with published pay scales, while others are on less transparent contracts (P1; P3). As one participant noted, "It's very hard to say—salaries are confidential…" (P3).

Secondly, perceptions of fairness do not always align with lived experience. One of the most striking examples came from a participant who discovered she was earning significantly less than a male colleague despite holding the same responsibilities and experience.

> *Several years ago, while I was working at another Estonian ICT agency, I found out from a colleague that a male team leader—who had the same responsibilities and experience as I did—was earning 500 euros more than me per month. I was really disappointed, but I didn't say anything or ask why. I knew my boss was somewhat sexist,I had heard him say inappropriate things, like 'Why are you so emotional today? Is it that time of the month?' So I knew that even if I said something, nothing would change' later I left the organization. At the time, there was no way to report the issue, and the manager "still works there today" as senior leadership (P9).*

Another common explanation for pay gaps was the impact of career interruptions, especially due to care-giving responsibilities. Several participants observed that women are more likely to take longer parental leave, which can delay promotions or wage growth.(P1;P4;P5;P8). "Coming back later can be hard. The team dynamics may have changed, salaries might have gone up, but your salary stays the same... most people still expect women to be the ones at home with the babies, and that's considered normal" (P4). These career gaps might explain why men often advance more steadily over time.(P1;P3)

After analyzing internal pay structures, the HR team identified another contributing factor to the gender pay gap. In technical roles, the link between expertise, experience, and salary was particularly evident. Due to high entry requirements in fields like cybersecurity, employers sometimes recruit women with less experience or alternative qualifications, which leads to lower starting salaries. "Someone with less experience might still be a good fit and grow into the role, but in the beginning, of course, we offer a lower salary—because otherwise it wouldn't be fair to those already in the role with more experience" (P6).

The issue of salary negotiation was also mentioned. "Women don't ask for more,they usually ask what we're offering and then decide if it's suitable. But men ask for more" (P6). This aligns with similar observations that women are often more self-critical or objective when assessing their own readiness (P5; P7. Some participants acknowledged improvement in pay equity over recent years. In the past, middle managers had more discretion in determining team salaries, which occasionally led to

inconsistencies. "Now I think the organization is improving in making sure that similar roles have similar salaries… we are moving in the right direction" (P7). Structured systems such as salary bands or "work families" were introduced in some institutions to group roles and stabilize salary expectations .(P4)

4.2.1.3 The Glass Ceiling and Glass Cliff

Interviewees offered a variety of perspectives on the existence and nature of glass ceilings in Estonia's public sector ICT organizations. While several denied the presence of formal, gender-based barriers, many acknowledged structural and cultural challenges that disproportionately affect women's access to top leadership positions.

One recurring theme was the role of internalized expectations. Many participants observed that women tend to hold themselves to higher standards, often waiting until they feel "perfectly ready" before pursuing promotions. As one participant explained, "It's sad to me to see that women are sometimes limiting themselves and thinking that they are not ready for the leadership position. You can never be perfectly ready." It was also highlighted that in leadership, one has to make decisions based on imperfect conditions and thus accept some room for failure — and delegate tasks to others, not just do all the work alone. (P5)

This perception was echoed by others who emphasized the need to take initiative despite imperfect readiness, and the tendency for women to over-prepare or underestimate their qualifications for leadership positions (P4; P7).

Some participants noted that leadership roles are often perceived as incompatible with care-giving responsibilities. Certain positions require frequent travel or on-call flexibility, especially in operational fields like cybersecurity. As one interviewee put it, "Some leadership positions require too much travel, too much being away from family and kids… Sometimes they postpone having kids because of work. And then it's biologically too late." (P5)

Others highlighted structural limitations that were not necessarily gender-based. One participant said, "I don't think there is a glass ceiling in that way. I think there's just a ceiling—because when you're a team lead, the next step would be department lead or director, but there are only about three such positions in the whole organization… Those positions don't change often" (P4). Still, the long-term occupation of top roles by men can indirectly restrict opportunities. As another interviewee explained:

> *When it gets crowded at the top, then it's not about male or female,no one wants to move away from the top… But if the pyramid is covered by male positions, then it's hard,perhaps you need a bit more push to get yourself out there as a female; In order to get some leadership position, you have to have had some prior experience. But women often make sacrifices—because of care-giving responsibilities, it might be even more difficult. It's like a catch-22(这里加上解释 给忘了。。).(P5)*

Not everyone saw a glass ceiling. One participant observed that "in the highest positions, it could be as equal as it can be" (P3), citing examples of strong female leadership in her agency. However, she acknowledged that promotions to top roles like Director General often require patience and alignment with political cycles, which can lead women to change agencies in pursuit of quicker advancement. "Women tend to move forward faster when they don't see themselves reaching their goal… They just don't want to waste time." (P3)

Some participants also pointed out that not everyone aspires to leadership. For some, technical roles offer better stability, compensation, and personal fit,Some people just want to keep their technical position,it's higher paid and stable, and such positions are really hard to find (P7).

In addition to institutional and cultural challenges, personal security concerns were also mentioned as a potential barrier for women aspiring to senior leadership roles.

> *I remember an all-women lunch with a female commissioner who shared that she chose not to run for president due to threats to her family. Even our former Prime Minister mentioned that there were moments when she received life*

> *threats, and the police didn't take it seriously at first. If someone makes a health-threatening comment, you take it very seriously. I'm not in a position to say that women take it more seriously than men. I don't know how men take it. But these things do exist. I think of the assassination of the Swedish Foreign Minister more than a decade ago, and also the Danish Prime Minister was attacked. Estonia has had a female President, a female Prime Minister,and I think the police and law enforcement agencies are now a bit more trained to be attentive to these possible threats… (P5)*

The notion of the "glass cliff"—where women are more likely to be promoted during crises—was mentioned briefly. One participant reflected, "It's hard to say because our agency is always in some kind of crisis. So it's difficult to separate that from the promotion process" (P2). In most cases, participants attributed leadership appointments to timing, qualifications, and team dynamics rather than crisis-driven decisions.

4.2.2 Organizational Culture and Norms: Inclusion, Bias, and Professional Identity

Beyond formal policies and procedures, organizational culture profoundly shapes the everyday experiences of women in ICT roles. Participants described a generally respectful professional environment, yet also highlighted subtle, persistent gendered patterns that influence how roles are distributed, expectations are formed, and opportunities are perceived. These patterns often emerge in the division of labor, decision-making culture, and informal norms surrounding recognition and inclusion.

4.2.2.1 Gendered Division of Labor in Technical vs. Support Roles

Participants consistently observed that technical roles—particularly in infrastructure programming—remain male-dominated, whereas women are more frequently found in administrative, analytical, or coordination roles (P2; P3; P6; P7; P8; P9). As one participant noted, "In the administrative area, almost all are women. And in IT, we have shown that the programmers are mainly men" (P8). This pattern was echoed across multiple agencies.

It was reported that departments like cybersecurity and electronic identity have seen increasing female participation, while older, infrastructure-related departments remain overwhelmingly male, particularly in roles like DevOps. Some teams working on interoperability and electronic identity have grown significantly due to new EU regulations, resulting in more positions with nearly equal numbers of men and women. However, for more technical roles such as DevOps engineers or architects, approximately 90% of applicants are still men (P3).

While the hiring process was generally described as merit-based, participants noted that the gender composition of the applicant pool frequently determined recruitment outcomes. "It’s not that we don’t hire woman for technical roles—we just don’t get their applications," one interviewee explained (P8).

Several reasons were mentioned. In addition to lower levels of confidence or interest, a lack of awareness about the diversity of ICT-related majors and career paths was also identified as a contributing factor. As one participant commented, many women mistakenly assume that IT-related jobs are limited to highly technical tasks like "fixing computers," and such distinctions are often not clearly explained or taught in school (P4).

4.2.2.2 Stereotypes, Confidence, and Perceived Competence

Participants highlighted that deeply rooted gender stereotypes continue to influence women’s self-perception and professional positioning within ICT environments. These stereotypes often originate from early socialization—through family expectations, educational pathways, and broader societal norms—and persist into adulthood, shaping confidence levels and perceived competence (P1; P2; P3; P7; P9). As one participant recalled, "It begins in childhood and continues in school. Boys cannot cook. Girls cannot repair cars." She also shared that her grandmother once advised her to forgo high school in favor of housekeeping school, which was considered more appropriate for girls at the time (P9).

As one participant noted:

> *The stereotype and pressure on women is a general thing from society. And also a bit from how Estonian parents raise their children—especially those who grew up during the Soviet Union era. Those parents tend to push their kids to be the best. That's not always bad, but sometimes we take that pressure the wrong way (P4).*

Stereotypical assumptions were also widely identified as reinforced through both formal education and informal interactions (P2; P8; P9). Even in kindergarten and school, participants recalled clear role divisions—boys were discouraged from "playing home," and girls were steered away from tasks like car repair or robotics (P9). One participant described how, while leading a robotics after-school club, the group initially had only boys and one girl. However, when that girl shared her positive experience, more girls joined the club the following week. It starts from what your friends are playing with and what kind of toys you have at home. This early exposure to gendered expectations limited many girls' sense of belonging in ICT, leading them to internalize the belief that such careers were "not for them" (P2). As children grow older, she continued, teachers, role models, and media portrayals begin to shape perceptions of who belongs in technical fields. She also mentioned that:

> *In the early seasons of The Big Bang Theory*[3]*, all the intelligent characters were male, while the main female character, Penny, was portrayed as not that smart. Pop culture has a lot to do with this. Who do we see in the movies, series, or video games? What do those people do, etc.? (P2)*

This early exposure to gendered expectations limited many girls' sense of belonging in ICT, leading them to internalize the belief that such careers were "not for them." One participant noted the observation that the adults would instinctively turn to boys if there is a computer problems (P9). Others emphasized how school and family

[3] *The Big Bang Theory is a popular American sitcom that aired from 2007 to 2019. The show follows a group of academically gifted male scientists and their social interactions, including with a female neighbor. It has been noted in some analyses for its portrayal of gender roles in science and technology settings, including the reinforcement of certain gender stereotypes.*

influence shaped educational choices, often encouraging girls to pursue more "soft"roles like nursing,finance or business rather than technical fields (P8).

Concerns were also raised about the resurgence of conservative gender ideologies via online platforms. One participant cited the influence of figures like Andrew Tate, whose media content promotes outdated ideals of women as housewives and men as sole providers. She warned that this posed a growing cultural risk, particularly for younger generations (P9).

Participants further spoke of subtle forms of gendered behavior in the workplace. Older male colleagues were sometimes described as making inappropriate or outdated jokes, especially in informal settings. "Sometimes some 50-plus males are making jokes… I have to step in and stop it," one participant remarked, adding that her presence has led to increased gender awareness and caution (P3). Another participant shared that a senior leader once made a sexist remark and discussing women's emotional behavior (P9).

Expectations around emotional expression were also reflected shaped by gender stereotypes. Several noted that women were often expected to suppress passion or visible emotions in professional settings to avoid being perceived as "too emotional" or "unprofessional." As one participant shared, "I try not to be too emotional, because I think maybe others feel the same way as I do—like I'm attacking them. Even when I'm just passionate and want to get things done" (P4). She added that men appeared to face a higher tolerance for emotional expression before being judged as aggressive. Another interviewee reflected on her previous workplace where "you had to have a stone face… you had to argue with facts, not with feelings," noting that emotional expression, particularly for women, was discouraged as a norm in technical fields (P9).

A human resources executive (P6) further observed that such perceptions extend into recruitment and promotion practices. Women were often labeled as "too emotional"

even before joining the organization, sometimes by female evaluators themselves. She noted that women are commonly associated with "soft topics," while results-driven men were valorized—even when their leadership left behind dysfunctional teams. This reinforced a narrow definition of professional success and perpetuated biased evaluation standards.

Expectations around emotional expression in the workplace also appeared to reflect enduring gendered assumptions. Rather than being encouraged to show passion or urgency, women often felt the need to self-monitor their behavior to avoid being perceived as "too emotional" or "unprofessional." (P1;P3;P8;P9) One participant reflected that she sometimes holds back when presenting ideas, particularly in environments where she senses others may judge her passion as excessive: "I try not to be too emotional, but sometimes I'm just passionate about something and want to get things done" (P4). This sense of holding back was particularly evident in male-dominated technical spaces,as mentioned:

> *Since I've started this technical role, I've been to many cybersecurity-related events, and sometimes I am the only woman,It's overwhelming. It's hard to ask questions or say anything because you feel that maybe you're stupid… There's a really good word—impostor syndrome. (P1)*

Others noted that these expectations were not limited to individual behavior but were embedded in broader institutional processes. Women are sometimes labeled as "too emotional" even before they enter an organization—often during interviews, and sometimes even by female assessors themselves.

Contrary to the common stereotype that women are more emotional in the workplace, it also mentioned that:

> *Male leaders can sometimes be more emotionally demanding and require greater emotional support. You have to hold their hands significantly more than women who are in the same level or in the same position. Besides, often-praised results-driven approach does not necessarily mean a good thing all the time. Male team leaders tend to more focus on the results. It may achieve short-term gains, but often leave behind dysfunctional teams that*

> *require significant repair once the leader moves on or if there is a problem. Building a healthy, collaborative, and sustainable team culture may deliver slower results in the beginning, but proves more valuable in the long run (P6).*

Confidence emerged as a recurring theme across participants' reflections. A lack of confidence among women was reported in multiple professional contexts—including job applications, internal evaluations, promotions, and situations requiring technical problem-solving or public engagement (P2; P3; P6; P7).

Confidence was also described as a key differentiator between male and female colleagues. "Men are more confident in themselves. That gives them a sense of relaxation in such situations… even if they actually don't know," one participant remarked, contrasting this with women's tendency to hesitate and question their competence, despite being equally capable (P9).

Some participants observed that colleagues in non-technical roles often showed reluctance when faced with tasks requiring even basic technical understanding. Although the issues were not necessarily complex, they were often perceived as overly difficult. Consequently, responsibility was frequently deferred to external ICT agencies such as RIA or RIK. This behavior was understood as stemming from a lack of confidence and a deep-seated perception that technical matters fall outside their domain (P1).

In addition, participants in leadership roles offered more nuanced reflections on how positional labels can obscure professional identity and create an "invisible burden of proof":

> *People tend to approach you based on your position—as a leader, not as a technical expert. This creates a situation where you have to remind others of your actual capabilities. Sometimes, to be fully recognized for your technical competence, you need to go an extra step or even change your position. It's not necessarily about gender, but this kind of labeling can be particularly frustrating in technical roles (P5).*

4.2.3 Representational Agency: Voice, Legitimacy, and Policy Influence

Beyond institutional structures and cultural norms, participants underscored the importance of representation as an active and enabling force. Representation was not only understood as numerical parity but as meaningful participation in influencing digital policies, services, and organizational decisions. For many interviewees, being present "at the table" allowed women to challenge dominant assumptions, raise overlooked concerns, and advocate for inclusive approaches in both strategic planning and service delivery. I

4.2.3.1 Diverse Perspectives and Women's Contributions to Inclusive Policy-making

Several participants emphasized that gender-balanced decision-making is essential to strengthening public trust and improving the quality of digital policies(P1;P3;P5;P6;P9). One participant noted that when only one gender dominates decision-making processes, the outcomes are less legitimate and less reflective of societal diversity. In her words, "I think equality is what could influence better decisions and better trust. One gender dominating… definitely doesn't bring trust to the society or to the citizens" (P3).

Another participant stressed that diversity should go beyond gender to include age and lived experience, emphasizing the value of including younger and older women alike in policy-making (P4). This idea of inter-sectional diversity was echoed by others who argued that different life stages—such as having children—Influence how people approach the design of inclusive services. As one participant explained, "If you don't have a child or you've never given birth, you probably don't have the same perspective. So that's why we need different types of people to design those very inclusive services." (P9)

Several examples further illustrated this point, particularly regarding how women's perspectives can enhance the inclusiveness and responsiveness of public services (P1;

P2). One participant (P2), reflecting on her experience in ICT service development, noted: "When we design a website or service for public use, it helps when you have different perspectives in the room.people may consider visually impaired citizens"She further emphasized that"In road design, people from diverse gender may raise questions like, where are the streetlights? Where can I walk safely with a stroller or kids?" (P2).

Thoroughness, attentiveness, and a user-centered mindset were mentioned:

> *In my team, I've noticed that women tend to test their products more with actual users. They go to the service users and ask for feedback. Men, on the other hand, might be more confident in their own solutions and just say, "I think this works, let's go with it." So yes, women can bring a more inclusive and thorough approach.(P4)*

> *Women do bring value—added value—if we are talking about digital governance. When I have women in the team, the reports are of higher quality: more precise, more organised, doing the homework, so to say. They listen, are more attentive, more diligent researchers. Maybe they take more time to prepare, but they deliver what is promised." (P5)*

Critically, participants were cautious not to frame these contributions in essentialist terms. Many rejected the notion that women inherently possess qualities men lack; instead, they viewed gender diversity as a structural tool for broadening deliberation and surfacing underrepresented needs. They also highlighted the broader importance of diversity in gender, age, background, and mindset.

4.2.3.2 Symbolic vs. Substantive Representation and importamce of role models

Most participants emphasized that their organizations do not implement formal gender quotas or strict numerical targets for representation. Many viewed such measures as unnecessary or incompatible with the merit-based principles guiding public sector recruitment in Estonia.(P3;P4;P6;P8) As one participant explained, "We definitely track statistics regarding the number of male and female employees we have, but we do not implement any quotas—not even for leadership positions… We hire based on

skills, previous knowledge, and relevant experience for the specific position" (P6). Another interviewee similarly remarked that gender-based hiring might even risk lowering overall competitiveness, unless there is already a strong and balanced talent pool to choose from (P6).

When discussing representation more broadly, many participants stressed that the legitimacy of diversity is not derived solely from demographic presence, but from meaningful contributions. As one put it, "It’s not about who is talking, but more about what they are talking about" (P1). Another added that a woman in a high-level role is not necessarily more empathetic or democratic than a man, and thus, representation must be judged by the values and content brought into the conversation—not the identity alone (P7). Still, despite these cautions, nearly all interviewees acknowledged the symbolic and practical importance of visible female role models, particularly for those early in their careers.

Several participants pointed out that women often set self-imposed limitations due to the lack of relatable examples. One interviewee shared: "Sometimes it doesn't matter if I have a technical degree or not. If I have a good idea —a solution to a problem—that's enough. But do I have a lot of role models that I can see have done that? If I don't have those role models, it could be discouraging. (P6) This sentiment was echoed by others who emphasized the importance of supporting mechanisms and role models:

> *Women often see limits they set for themselves due to a lack of role models and examples in the field. To overcome that, it’s important to have get-togethers where women in the same area can reinforce and encourage each other. I was inspired by the women’s breakfasts at the Munich Security Conference. These gatherings were incredibly rewarding—just joking, sharing everyday struggles in life and career. I remember someone saying it was reassuring to know she wasn’t the only or the first mother leaving a two-year-old at home to attend such a conference. I also think back to a few times when I’ve met women 10 or 20 years older than me, from a different generation, who made their careers in very tough, male-dominated contexts. Those are the kinds of moments that make a difference (P4).*

4.2.4 Challenges of Attracting ICT Professionals in the Public Sector

Although not the main focus of this research, challenges related to attracting and retaining ICT professionals in the public sector were frequently raised by participants. One of the most commonly cited barriers was the significant salary gap between the public and private sectors, particularly for high-level technical positions(P4;P6;P9). As one participant noted, "there is no way we could even compete," referring to the much higher offers provided by banks and private tech firms (P6).Perception issues are further exacerbated by limited investment in employer branding and outreach.Only a few government ICT organizations actively promote their culture and opportunities. Others remain cautious about spending taxpayer money on initiatives that could be perceived as unnecessary. As one explained, "we just try to do the essential and not spend more than we need—especially not taxpayer money on something that could be seen as a hassle" (P3).

In addition to financial limitations, the public sector was described as less visible and less attractive to younger professionals. Some participants highlighted that public sector employers are rarely present at student recruitment fairs, where startups and large private companies dominate. (P9) Similar public perceptions were mentioned:

> *There is this narrative in the country: "If you go into the public sector, you won't get paid well, you'll be stuck, just drinking coffee and doing nothing fun." But in reality, there are very cool projects happening and it is more flexible. There are fun events, even dogs in the office!(P4)*

> *There is some confusion. Every time the government changes, something has to change. It's not that popular. People think it's not that active. It's not a startup; you don't do something new. You deal with laws and regulations that were written over 20 years ago. So it's not attractive enough for young people.(P9)*

4.2.5 Benefits of DEI

Many participants emphasized that diversity, equity, and inclusion (DEI) practices offer tangible benefits to public sector ICT organizations, extending beyond gender to include differences in age, background, and professional experience. Rather than

focusing solely on women's contributions, interviewees broadly recognized that diversity in all its forms enhances decision-making, problem-solving, and organizational health.

Several participants underscored that diverse teams lead to better outcomes by incorporating varied perspectives. For instance, one interviewee highlighted that "different people from different backgrounds bring different views," which in turn enables more comprehensive and thoughtful problem-solving (P7). Another noted that if everyone in a team has the same profile, the approach to challenges may become too narrow, whereas diversity fosters both innovation and creativity (P5). These benefits were linked not only to gender but also to generational and experiential diversity. One participant expressed appreciation for having team members "born around 2000," as their unique energy could positively influence team dynamics and motivation (P4).

Gender-balanced teams were also viewed as advantageous. Several participants expressed that a mix of male and female team members allows for complementary skill sets and decision-making approaches. For example, one noted that men may be quicker to make decisions, whereas women tend to be more analytical or cautious—resulting in more thoroughly considered outcomes when both styles are present (P8). Another added that women may contribute more strategic thinking, which complements technical expertise traditionally held by men, creating a more balanced and effective environment (P3).

Beyond performance benefits, diversity was also linked to a healthier work environment. One participant explained that when a team is gender-balanced, individuals tend to behave more respectfully and communication is more constructive, whereas single-gender teams can lean toward unhealthy group dynamics (P8). Another described all-female teams as more transparent and emotionally supportive, especially in navigating personal issues that may affect work, such as health

challenges. She observed that balanced or female-led environments allowed for "open conversations" that contributed to well-being and productivity (P1).

Some participants also spoke about the role of inclusive leadership in fostering motivation and personal development. Being part of a supportive environment where one’s ideas are welcomed, and initiative is encouraged, was cited as a key factor in professional satisfaction. "If you're open to an idea or have your own motivation, you are heard and can help out," one participant noted, describing her organization’s informal but effective support culture (P1).

Nonetheless, a few participants cautioned that managing diverse teams can pose challenges. Coordinating people with different expectations, communication styles, or cultural backgrounds may require additional effort, especially when teams include both younger and more experienced professionals.(P5;P6;P9) One participant acknowledged that "managing such diverse teams might be challenging," particularly because it "requires more communication and mutual understanding" (P6). Yet despite these complexities, participants consistently agreed that the long-term value of DEI far outweighs the difficulties, reinforcing the belief that inclusion should be viewed as a strength rather than an obligation.

4.2.6 Existing DEI initiatives

While most interviewees indicated that their organizations do not have formal or gender-specific DEI strategies in place, many described a variety of informal support mechanisms, leadership practices, and state- or EU-level programs that contribute to fostering inclusivity.

At the organizational level, several participants emphasized the role of supportive leadership. One interviewee explained that in her small, female-majority team, there are no formal DEI regulations, but employees are encouraged to take on new initiatives if motivated. She described how her manager actively supported her participation in some initiatives and encouraged her to take on various tasks, such as

writing articles or conducting interviews, stating that "you are heard and can help out" if you show initiative (P1). Another participant stressed the importance of informal check-ins and one-on-one conversations, noting that simple, personal interactions can create a sense of being seen and valued, especially in the absence of formal programs (P8).

Mentorship was cited as a commonly implemented, though typically general rather than gender-targeted, practice. In several organizations, newcomers are assigned mentors, and employees transitioning to new roles can request additional support. Some departments also offer function-specific mentorship structures, such as units where business analysts are organized under dedicated coordinators who arrange regular meetings and offer guidance (P4, P9).

From a policy perspective, state frameworks such as the Public Service Act and the civil servant ethics code were mentioned as overarching governance tools that may include provisions indirectly supporting inclusive practices (P1). Additionally, Estonia has national mechanisms like the Commissioner for Gender Equality and the Labour Dispute Committee, which provide legal recourse for addressing workplace discrimination or inequality (P9).

Several participants referenced broader institutional or governmental training programs that, while not explicitly gendered, have proven inclusive in practice. For instance, the Ministry of Justice and Digital Affairs has launched various trainings on product and service management that are perceived as more accessible or appealing to women. As a result, these sessions often attract female participants and support their development in softer ICT skill areas (P6).

One illustrative initiative is a cybersecurity summer camp for girls aged 13–16, launched by a public agency which co-funded by Estonia and the EU’s Digital Europe Program. Initially designed to address the broader shortage of cybersecurity professionals, the camp evolved into a gender-targeted initiative after organizers

recognized the under-representation of girls in ICT and the need for a safe and inclusive learning environment. This shift was grounded in both empirical observations and inspiration from international programs.(P2)

> *We didn't start the camp as a girls-only program—it began as a response to the global shortage of cybersecurity experts. But we soon realized the lack of diversity as a major issue, especially in ICT areas like robotics and computer clubs, where girls are underrepresented. We found that scientific literature also highlighted this as a growth opportunity. Inspired by Girls Who Code[4], we saw that girls often hesitate to try and fail when paired with more experienced boys, sometimes reinforced by some teachers who simply provide the solution instead of letting them try and fail. So we created a beginner-friendly, safe space that didn't require prior knowledge. To our surprise, nearly 80 girls joined in the first year, and now it is open to international applicants, not only Estonians. (P2)*

One organization also reported implementing an internal equality strategy, formalized in a policy document outlining the principles, responsibilities, and practices for promoting gender equality (P6).

Finally, some institutions apply proactive but informal measures to improve gender balance in leadership. While not part of any quota system, managers monitor potential candidates internally and encourage capable employees—particularly women who may lack the confidence to apply—to participate in open competitions for leadership roles. This approach is grounded in meritocracy but supplemented by efforts to identify and support overlooked talent: "Sometimes you just have to bring out the areas that a person maybe doesn't see in themselves" (P6). These efforts have led to greater representation of women at mid-level leadership, especially in areas like product and service management.

In sum, although gender-targeted DEI programs are largely absent at the organizational level, a combination of supportive leadership, mentorship, national

[4] *Girls Who Code is a U.S.-based nonprofit organization founded in 2012 with the mission to close the gender gap in technology. It offers free coding clubs, summer programs, and learning resources to support girls and young women in computer science and related fields.*

policy mechanisms, and grassroots or EU-supported initiatives have contributed to building a more inclusive environment in Estonia's public ICT sector.

4.2.7 Practitioner-Driven Recommendations

In addition to describing existing experiences and challenges, participants shared a variety of recommendations to improve gender equality and inclusion in Estonia's public ICT sector. These suggestions ranged from early education and outreach to structural reforms in hiring and workplace support, reflecting insights drawn both from personal experiences and observed institutional gaps.

Several participants emphasized the importance of early exposure to ICT through accessible and inclusive education. This includes offering high-quality computer science classes at the high school level and providing clear, approachable explanations of what ICT careers entail.（P1;P4） One participant noted the need to "go to places where young people are making decisions" such as universities and career days, particularly to reach girls before they opt out of technical fields (P2). Another respondent similarly stressed the importance of "inviting professionals to schools, organizing workshops, and giving kids hands-on experience with ICT" to dismantle stereotypes and broaden understanding of the field (P7). Public awareness was also seen as crucial, not just among students, but across society—including in kindergartens and among families—so that "girls can be good at math and physics" becomes normalized (P9).

The presence of female role models and success stories was viewed as essential to inspire confidence. Participants referenced initiatives such as the scholarship and mentorship program launched by Kristel Kruustük[5] at TalTech, which supports female ICT students through the university's Development Fund (P1). Others

[5] *An initiative by Kristel Kruustük, who is the founder of Testlio, a software testing company,She provides scholarships to students at TalTech through the Development Fund, https://taltech.ee/en/news/women-it-kristel-kruustuk-role-model-and-inspirer*

highlighted the need to "really show" women working not only in HR but in core technical roles (P4).

Hiring practices were also a focus of participant recommendations. Several respondents called for changes to how job advertisements are written, criticizing listings that "require you to know everything," which may discourage women from applying (P4). Instead, positions should be framed in a more inviting and realistic manner. One participant added that publishing salary ranges could also help reduce gender disparities, as "women usually don’t ask for higher salaries; they ask what is offered and just accept or reject" (P6).Though less relevant in the fixed-pay structure of the public sector, this practice was still seen as contributing to a fairer hiring environment.

For those already in the field, mentorship and continuous support beyond the hiring stage were identified as important tools. Participants stressed that gender inclusion should not stop at recruitment but must extend into day-to-day experiences. One respondent noted that while managers may claim they are gender-neutral in hiring, "how [women] actually feel later on in the team" remains a separate and often overlooked question (P2). Others pointed to the importance of structured mentoring and coaching systems, particularly for women navigating male-dominated teams or seeking leadership roles (P5).

Leadership awareness was another common theme. Participants stressed that senior managers and HR departments need targeted support to understand gender-related challenges. One participant explained that awareness-building efforts must go beyond occasional lectures or diversity presentations, and instead be based on research and reinforced through ongoing activities such as inviting those already working in the public sector agencies, especially women,to give lectures at school on what actually those people do,also highlighted that the managers and HR need to have gender awareness.(P3)

Support for career changers was also emphasized. Participants mentioned several programs in Estonia that allow people from non-ICT backgrounds to transition into technical fields, including those with experience in project management, analytics, or design.(P1;P6) One participant emphasized that such individuals often "already have strong skills that are very similar to working in IT" and should be actively supported in their transitions. She elaborated further:

> *Sometimes the Accounting is considered a female area, but in fact, those people already have strong skills that are very similar to working in IT analytics. So it's important to encourage and support these kinds of transitions. Certain training programs would help to include those people in the IT sector as there is a shortage of ICT professional,after some experience and learning,some of them end up in a more technical position.(P6)*

Finally, several participants noted that ICT curriculum design and communication strategies may unintentionally discourage women. One participant shared:

> *I have a younger brother who started university in computer science. When I looked at the study descriptions, it said things like "you will be building robots." I don't want to build robots. It looks fancy but I think the curriculum is more designed to be attractive to males than females,there is actually more than building robots,you can do a lot cool and fun projects,you can do fashion or business with your CS degree as well.(P1)*

5. Discussion: Interpreting Challenges, Inclusion Benefits, and DEI Practices

The findings in Chapter 4 provided rich qualitative insights into how gender dynamics are experienced by women working in Estonia's public sector ICT institutions. Participants described a wide range of individual and organizational experiences that illustrate both formal advancements and persistent barriers to gender equity. Building on these empirical accounts, this chapter engages in a deeper interpretive analysis by situating the findings within broader scholarly literature and theoretical frameworks. It explores how the identified challenges reflect systemic patterns of gender inequality, highlights the perceived benefits of diversity and inclusion as articulated by

practitioners, and examines the scope and limitations of current DEI practices in public ICT organizations. In doing so, it aims to contextualize the empirical data and inform more targeted, evidence-based policy and organizational recommendations.

5.1 Revisiting Gendered Challenges in Estonia's Public ICT Sector

A key issue is the under-representation of women in highly technical or senior roles, such as system architects, DevOps engineers, or cybersecurity analysts. Participants noted that although hiring decisions are not overtly biased, in practice "there was no competition from females" for certain roles (P3). This aligns with Kanter's (1977) tokenism theory, which posits that when women constitute a small minority in a field, they experience heightened visibility, stereotyping, and role encapsulation. One participant observed that when attending cybersecurity-related events, being the only woman made it difficult to ask questions, as "you're super visible" and feel additional pressure not to underperform and think you might look stupid (P2). Another participant shared that "they treat you as a leader, rather than a technical person (P4), reflecting Kanter's concept of role stereotyping, where women are perceived through a narrow lens shaped by gender norms.

The second systemic barrier lies in the gendered educational pipeline and cultural perceptions about ICT careers. Several participants described how girls opt out of technical pathways early due to stereotypes, lack of female role models, and a perception that ICT is abstract or "robot-building," which feels unrelatable (P4). One shared that even her younger brother's university curriculum seemed more tailored to male interests, This aligns with findings from Shore et al. (2011) on how organizational norms and cultural perceptions influence inclusion, and with a broader McKinsey analysis showing that early STEM exposure often leaves girls behind (McKinsey Global Institute, 2018).

Confidence also emerged as a recurring theme. As prior research shows, women in male-dominated sectors often assess their abilities more conservatively than their

male peers (Ely, 1995). This was echoed by participants who emphasized that women tend to underestimate their qualifications or feel the need to be "perfect" before applying for technical roles (P1;P5;P6). In the words of one participant: "Sometimes women are more subjective about their performance during the interview or don’t even apply" (P5).

Structurally, the expectation that most leadership positions require in-person presence continues to disadvantage those with caregiving responsibilities, who are still predominantly women.While flexible and hybrid work has become more normalized since the pandemic, senior roles often involve decision-making and visibility in meetings, limiting progression opportunities for women needing flexibility (P6). besides, only one senior-level professional stated at the beginning of the interview that she had never encountered gender-related obstacles in her career. She insisted that most difficulties were self-imposed and emphasized the importance of individual attitude. However, as the conversation progressed, she candidly admitted that balancing professional demands with caregiving responsibilities was challenging at times.(P5)

This supports broader literature on the "second shift" and the gendered division of labor, where women perform more unpaid caregiving work and thus face limitations in career advancement (Acker, 1990; Williams et al., 2018).

Although salary scales in the public sector are typically standardized, perceived fairness and transparency still matter—especially when pay ranges are not publicly disclosed. These accounts align with broader research showing that gender-based disparities in pay are often reproduced through informal norms and structural constraints, including caregiving responsibilities and part-time work patterns, which disproportionately affect women’s earnings over time (OECD, 2021; Acker, 1990).

Finally, participants noted that while overt discrimination was rare, a lack of managerial awareness about the subtler gendered dynamics remains a challenge.

Although recruitment may appear inclusive, organizations often lack follow-up mechanisms to assess how the employee feel integrated or supported after joining. As one interviewee stated, "some teams looks great outside,but it might be already fragile inside" (P6). These patterns suggest that while formal equality may be improving, substantive inclusion needs more attention.

These findings underscore that gender inequality in Estonia's public ICT sector is not driven by explicit exclusion, but by intersecting structures of education, socialization, organizational practice, and cultural expectation. A meaningful approach to inclusion must thus look beyond hiring statistics and engage with deeper systems that shape opportunity, confidence, and representation.

Importantly, these dynamics must also be understood within the broader administrative context of Estonia as a small state. With a limited talent pool, the public sector often relies on flexible organizational roles and informal recruitment channels to fill highly specialized ICT positions (Randma-Liiv, 2002). Several participants confirmed this structural reality, noting that "for highly difficult-to-fill positions, we sometimes have to turn to personal networks to ask if they have recommendations" (P8). Others highlighted the strong cross-agency familiarity among professionals, where staff from one organization frequently collaborate or have worked with peers in other institutions.（P1;P6;P8;P9）This tight-knit environment, while beneficial for agility and inter-agency coordination, may also constrain the reach of formal diversity initiatives. Informal norms and long-standing interpersonal ties may unintentionally favor insiders and limit access for individuals from underrepresented groups, especially those without established networks. These structural characteristics of small states thus shape not only administrative capacity but also the conditions under which gender inclusion efforts succeed or stall.

5.2 Inclusive Work Environments and the Value of DEI

The interviews revealed that inclusive work environments are not only beneficial for gender equity but also for building healthy, supportive, and collaborative workplaces, as well as improving the quality of public services. Participants emphasized that diversity—when actively supported—can enhance communication dynamics, reduce blind spots in decision-making, and foster more empathetic and innovative public service design. This reflects Shore et al.'s (2011) *optimal distinctiveness theory*, which suggests that individuals thrive in environments where both uniqueness and belonging are valued. Similarly, Mor Barak's (2015) *inclusive workplace model* highlights the importance of systemic inclusion at all levels of the organization, from formal policy to interpersonal interaction.

One of the most frequently cited benefits of gender diversity was the improvement of team dynamics, innovation, and collaborative problem-solving. Several participants noted that people with different gender identities may bring varied perspectives to technical discussions. For instance, some respondents observed that men often prioritize quick execution and are more relaxed about the process, whereas women are more likely to reflect deeply before acting, ask more clarifying questions, and aim for thorough and thoughtful decision-making. "Men are usually chill, but women tend to be more critical of themselves and want to do things perfectly," one participant noted (P4). Such dynamics, when balanced, were said to support more deliberate and inclusive outcomes.

The presence of women in teams was also associated with a reduction in toxic or unhealthy communication patterns. One participant shared that "men will be more careful about the language they use when there is a female colleague present" (P3), illustrating how gender diversity can encourage a more respectful and self-aware environment. Another participant emphasized the importance of gender awareness in leadership and peer interaction: "If a male colleague or supervisor doesn't understand the impact of hormonal cycles on women, it becomes difficult to ask for a day off or

to balance work with personal well-being—it brings mental burden" (P1). She described her past experience in all-female teams as more transparent and emotionally open, where personal matters could be shared without fear of judgment. At the same time, she acknowledged that well-balanced mixed-gender teams—when mutual understanding is present—can also be highly effective.

At the leadership level, participants repeatedly stressed the importance of supportive and gender-aware managers. One respondent shared a positive example where her supervisor encouraged her participation in various personal and professional development events.(P1). In contrast, another participant described a more negative case, where a senior manager made inappropriate comments and held gendered views—such as believing that men should earn more because they are "breadwinners." She also recounted a promotion process in which a qualified female colleague was denied even the opportunity to participate in promotion competition, with the vague judgement that she lacked interpersonal skills. Notably, the assessment panel consisted of seven men and only one woman (P9). These contrasting experiences highlight how leadership attitudes and organizational culture significantly shape employees' perceptions of fairness and inclusion.

Beyond organizational culture, participants also discussed the broader value of gender diversity for public ICT service delivery. Some emphasized that women's perspectives contribute to more user-centered and socially responsive digital tools. "Women colleagues tend to spend extra time and test the product with actual users, while male colleagues are more confident and think the product is well-designed and good to go,and one gender dominating definitely doesn't bring trust to the society or to the citizens" (P3). These observations support literature linking gender representation to legitimacy, accountability, and improved public trust (Riccucci, 2021; McCandless et al., 2022).

Nevertheless, one female participant frankly expressed a preference for working with men, citing a personal perception that communication with male colleagues tends to

be more easy and transparent. (P3) While this view may reflect individual preference and contextual experience, it illustrates the interpersonal dynamics present in diverse teams.

Those suggest that inclusive work environments depend not merely on numerical representation, but on leadership behavior, workplace culture, and organizational responsiveness to gendered experiences. The benefits of diversity are not automatic; they require active and intentional support to translate into improved communication, stronger teams, and more inclusive public services.

5.3 Reflections on DEI Practices

The interviews revealed that while many public sector ICT institutions in Estonia endorse principles of gender equality, some participants mentioned that their organizations do not have specific initiatives designed exclusively for women and usually it is for all employees, such as structured mentorship programs or some training projects. Career progression was often described as self-directed, relying more on individual motivation and informal encouragement than on systematic institutional support. As one participant noted, "there’s no clear career development strategy—it’s mostly up to yourself" (P2).

Participants also reflected on how formal channels for reporting inappropriate behavior were not always available in the past. One interviewee recalled that "no one would complain because there was nowhere to complain" (P6). At the same time, several participants observed that such mechanisms have improved in recent years, with clearer structures now in place to address concerns and support affected staff. These developments reflect broader shifts in organizational awareness and responsiveness to gender-related issues.

While DEI is generally recognized as an institutional value, participants emphasized that structural policies alone are not sufficient. Cultural awareness and leadership sensitivity continue to play a crucial role in fostering everyday experience of inclusion.

As Shore et al. (2011) argue, genuinely inclusive workplaces must foster both a sense of belonging and recognition of individual distinctiveness—outcomes that depend as much on interpersonal dynamics as on formal frameworks. In this light, the reflections shared in the interviews suggest that while foundational steps have been taken, advancing DEI further will require a combination of supportive structures and sustained attention to everyday cultural practices and leadership behavior.

5.4 Implications and Future Research Directions

5.4.1 Practical and Policy Implications

This study offers several reflections to inform future efforts aimed at enhancing gender diversity, equity, and inclusion (DEI) within Estonia's public ICT sector.

At the institutional level, improving transparency in recruitment and promotion procedures may contribute to more equitable outcomes. As raised by participants, measures such as blind CV screening—removing names, photos, and gender indicators—have been applied in some national contexts to reduce potential bias and could be considered to support objective evaluation processes in the public sector (P6). Expanding internship opportunities for ICT students and recent graduates was also viewed as a practical step to diversify early career entry points and cultivate future talent.

Findings also reinforce the continued relevance of the gender pay gap, which was widely perceived as a structural challenge. Strategies such as publishing salary bands or establishing standardized compensation criteria may help improve pay transparency and reduce gender-based disparities. Furthermore, targeted efforts to support career transitions—particularly for professionals from non-traditional ICT backgrounds but with relevant skills—were highlighted as a promising response to existing talent shortages and as a means to diversify the sector.

Although several participants acknowledged improvements in areas such as parental leave, others described persistent challenges in reconciling work and caregiving responsibilities. Reports of burnout, mental overload, and career stagnation after returning from parental leave point to the need for policy mechanisms and organizational support structures that are responsive to these tensions, especially during the early stages of caregiving (P5, P7).

At the organizational culture level, the findings suggest that implicit biases and masculine-coded workplace norms continue to influence employees' everyday experiences. Addressing these cultural patterns—alongside institutional reforms—may be critical to fostering more inclusive environments. In particular, the presence of psychological safety and informal support systems emerged as important conditions for women's participation and retention in the ICT sector. Several participants emphasized the value of informal networking opportunities among female professionals. One interviewee, for example, reflected on the Munich Security Conference's women's breakfast, where open dialogue and peer exchange were facilitated among senior women leaders (P5). Similar formal or informal initiatives may help build visibility, trust,confidence and inclusive leadership pipelines—especially in male-dominated fields.

While gender-specific empowerment programs were not viewed as essential by most respondents, some recognized the potential value of selected practices from the private sector—such as targeted mentoring, visibility initiatives, or outreach to women in ICT—as complementary strategies, particularly for early-career professionals or those lacking access to role models.

The findings also point to potential areas for development within the education system. Teachers and advisors may play a crucial role in encouraging girls not only to excel but also to take risks and learn through failure—an approach perceived as important in building long-term confidence. Moreover, participants noted that students are not always clearly informed about the interdisciplinary nature of ICT-related fields.

Clarifying the breadth of opportunities beyond traditional programming roles—such as data science, cybersecurity, and digital governance—may contribute to more gender-inclusive recruitment and attract more girls and women to apply,learn,and enter in the ICT domain.

Finally, while some formal reporting mechanisms for harassment and discrimination are in place—such as the Commissioner for Gender Equality and the Labour Dispute Committee—awareness and accessibility appear to be limited. Only one participant explicitly referenced these mechanisms, indicating that further efforts may be needed to enhance their visibility and communication. Promoting broader understanding of these protections and how to access them could support a more trustworthy and inclusive working environment across the public sector.

5.4.2 Limitations of the Study

Although the best efforts were made to address the research questions within the scope of this master's thesis—through carefully designed semi-structured interviews, purposive sampling, and rigorous thematic analysis—some limitations should be acknowledged.

First, while the sample size of ten participants is methodologically appropriate for a qualitative study and yielded rich, in-depth data, the original research design aimed to include a broader spectrum of perspectives. In particular, the study intended to incorporate insights from male professionals and junior to mid-level employees. Despite multiple outreach attempts, only one male respondent participated, and most of the interviewees were in senior or leadership positions with more than 20 years of experiences in the field (6 out of 10). Although their reflections were valuable,comprehensive and analytically rich, the relatively limited representation of junior and mid-level professionals may constrain the scope of experiences captured. This distribution occurred organically and was not the result of deliberate selection; in

some cases, potential participants may have declined due to the perceived sensitivity of the topic or hesitations related to their role as civil servants.

Second, language emerged as a potential limitation during several interviews. Some interviewees—particularly public sector professionals accustomed to working primarily in Estonian—occasionally struggled to find precise English expressions. This led to moments of hesitation or ambiguity, which may have affected the clarity or depth of some responses.

Third, the process of collecting supplementary institutional and statistical data posed challenges. For example, certain information about gender composition or pay distribution was only available on Estonian-language websites, and in some cases, the English-language versions of public sector sites offered incomplete or different content. Moreover, specific organizational data—such as the gender breakdown of ICT units or internal salary ranges—was often not publicly available and required direct contact with individual HR departments.

5.4.3 Recommendations for Future Research

Building on the findings of this study, future research could further explore several under-examined dimensions.

First, given the recurring emphasis on parental leave, flexible working conditions, and the challenges of reconciling caregiving responsibilities with professional advancement, future studies could examine how existing work–life balance policies are implemented and experienced in practice in Estonia. Although national frameworks—such as parental leave entitlements—are generally viewed as progressive, participants in this study pointed to ongoing structural and emotional strains, particularly upon returning from extended leave. Further qualitative or quantitative research could investigate how these mechanisms function at the organizational level, and to what extent they contribute to sustained career progression or reinforce gendered divisions of labor.

Second, the topic of career transitions into ICT roles emerged as both a potential strategy for addressing talent shortages and a site of gendered barriers. Several participants highlighted that women in fields such as accounting or data administration may possess highly transferable skills, yet face informational or perceptual hurdles when attempting to shift into ICT. Future research could explore the effectiveness of re-skilling pathways, mentoring initiatives, and strategies aimed at supporting such transitions, especially within the context of public sector.

In relation to pay equity, a notable insight raised in interviews was that while salaries are formally standardized for equal roles, gendered differences at the point of entry—particularly regarding prior technical experience—may contribute to long-term disparities. This suggests a need for research into the mechanisms by which pay gaps emerge and persist, including hiring practices, internal promotion structures, and return-to-work arrangements following parental leave.

Cross-national comparative studies with other Nordic and EU countries could yield valuable contextual insights—particularly regarding structural support mechanisms such as parental leave, flexible work arrangements, and pay transparency. Such comparisons could help illuminate how national policy models interact with organizational cultures and day-to-day inclusion practices.

Another limitation identified in this study—the of male perspectives—suggests an opportunity for future work to engage more systematically with the role of male colleagues, managers, and leaders in influencing inclusive environments, ethnically diverse voices would also provide a more holistic understanding of intersectional dynamics in public sector ICT workplaces.

Methodologically, mixed-methods designs combining in-depth interviews with larger-scale surveys or document analysis could enhance analytical robustness and support generalization across contexts. In particular, longitudinal research may be

useful in tracing how organizational culture and gender representation shift over time in response to policy interventions or broader societal change.

Emerging media environments also warrant scholarly attention. One interviewee expressed concern about the growing influence of online content that reinforces traditional gender roles among younger audiences. Future research could investigate how social media, podcasts, and digital influencers affect young people's perceptions of ICT careers, leadership aspirations, and gender norms, especially in the Estonian context.

Finally, several comments pointed to a largely unexplored research gap: the emotional and psychological costs associated with pursuing leadership roles in ICT, particularly in public-facing positions. While threats and safety concerns have been examined in the context of electoral politics, their impact on career decisions within administrative domains remains under-studied. Exploring how perceived or actual risks affect women's willingness to pursue senior roles in public service would significantly enrich current understandings of institutional exclusion and self-selection.

Collectively, these areas underscore a broad research agenda—one that goes beyond surface-level equality to critically explore the structural, cultural, and discursive dynamics influencing gendered career trajectories in the public sector ICT domain.

Conclusion

This study investigated whether and how under-representation of women exists in Estonia's public sector ICT domain, and explored the barriers that female professionals face in participating, advancing, and influencing within this critical field. By drawing on insights from ten professionals across six key ICT agencies, and analyzing their experiences through the lens of institutional structures, organizational culture, and representational agency, the research reveals how formal gender-neutral frameworks coexist with enduring, often invisible, inequalities that Influence career outcomes for women.

While the Estonian public sector positions itself as a merit-based and digitally progressive environment, the findings suggest that institutional processes—particularly recruitment and promotion—often lack transparency and fail to systematically address gender disparities. Although formal policies do not explicitly discriminate, participants emphasized that gender stereotypes formed in early education, family expectations, and cultural narratives surrounding ICT as a "male domain" continue to influence women's decisions to enter or remain in public sector ICT domain.

Organizational culture further reinforces gendered dynamics. Despite a widespread belief in equal treatment, implicit expectations surrounding leadership—such as assertiveness, result-driven leadership style,or technical prestige—remain closely associated with masculine-coded norms. These unspoken standards contribute to occupational segregation and limit women's presence in high-level technical and decision-making positions. Additionally, women described internalized barriers, such as perfectionism, fear of failure, and a lack of confidence, which are often exacerbated by a lack of visible female role models and insufficient peer support. Caregiving responsibilities and rigid career structures add to the complexity, especially when flexible arrangements or supportive policies are not consistently available.

In terms of representational agency, the study found that while women are increasingly present in advisory or support functions, their voices remain underrepresented in core technical and strategic decision-making arenas. Yet, those who have succeeded in these spaces emphasized the distinct perspectives they bring to digital policy design, citizen-centric services and more informed, responsive decision-making. Their experiences underscore the importance of not only symbolic inclusion but substantive participation in Estonia's digital governance and public innovation processes.

This study contributes to the literature on gendered institutions, representative bureaucracy, and DEI in the context of public sector innovation. Drawing on empirical data from Estonia—a digital frontrunner—it sheds light on how gendered dynamics and implicit biases persist even in technologically advanced administrations. The Estonian case demonstrates that digital maturity alone does not ensure inclusive governance; deliberate institutional and cultural efforts are needed to foster equity within public sector ICT domain.

Based on the findings, several policy and practice-oriented recommendations emerge. These include enhancing transparency in promotion and evaluation processes, formalizing mentorship and peer networks, increasing the visibility and accountability of DEI measures, and supporting career transitions between technical and non-technical roles. Furthermore, raising awareness of diverse public sector ICT career paths—particularly through education and early-stage orientation—can help attract a wider range of professionals into the field.

Finally, while this study offers valuable insights from experienced professionals across six major ICT agencies, the sample leans toward mid- to senior-level roles. As such, it may not fully reflect the perspectives of entry-level staff or individuals in more operational roles, whose experiences may differ in meaningful ways. Additionally, while qualitative interviews allow for in-depth exploration, they are not designed to capture broader patterns across the entire sector. Future research could

incorporate a broader range of organizational levels, include more grassroots perspectives, or adopt mixed-method approaches to assess the implementation and impact of DEI efforts over time. Cross-national comparisons and intersectional analyses would also enrich understanding of how gender, age, ethnicity, and other identities influence experiences, opportunities, and inclusion within public sector ICT domain.

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