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Digital Inclusion in Finnish Smart Prison: A Qualitative Analysis of Incarcerated Women's Experiences

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Abstract

Digitalization offers significant opportunities to support the rehabilitation and reintegration of incarcerated individuals, yet the limited digital access in prisons underscores the need to modernize prison environments. This study explores the digitalization of Finnish prisons from the perspective of incarcerated women, focusing on the concepts of digital inclusion and the "smart prison." The study asks: How do incarcerated women perceive the significance of the smart prison? What are the main prerequisites for and challenges to digital inclusion within Finnish smart prisons? What specific characteristics are associated with the Finnish smart prison concept? The study follows a qualitative approach, with data collected through interviews with 12 incarcerated women. The findings reveal both positive and negative experiences regarding digital technologies and the smart prison environment. The study identifies that digital skills and motivation are essential to achieve digital inclusion, yet some women lack these. Restricted access to online services presents barriers, positioning staff as gatekeepers. However, the introduction of in-cell laptops has significantly reshaped prison culture, enhancing interaction between prison staff and incarcerated individuals, which emphasizes the role of staff in facilitating access and supporting the use of digital services through motivational interaction. The research indicates that the Finnish smart prison combines ICT infrastructure with rehabilitative and face-to-face interaction, aiming to align prison conditions with those of society outside, in accordance with the principle of normality. However, full adherence to this principle remains challenging due to factors such as security concerns.

Keywords

digital inclusion; incarcerated women; qualitative research; re-entry; smart prison

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1. Introduction

In recent decades, digitalization in the penal landscape has increased significantly (Knight et al., 2023; Knight & Van De Steene, 2017). Increasing numbers of prisons are utilizing advanced technologies to enhance security, streamline administrative processes, and improve incarcerated people's rehabilitation. The enabling of internet and digital services for incarcerated people can support their education and rehabilitation during their imprisonment as well as facilitate housing, employment, and social benefits-related matters upon release, thus also facilitating their return to society (Barreiro-Gen & Novo-Corti, 2015; Passey et al., 2018; Reisdorf & Rikard, 2018) and helping to prevent recidivism (McDougall et al., 2017).

However, implementing digital technology in prisons involves several challenges related to high financial costs, ineffective designs, organizational unreadiness, infrastructural limitations, environmental factors, and low digital literacy among both staff and incarcerated people (see Imandeka et al., 2024a, 2024b; Knight et al., 2023). Ethical concerns related to privacy, bias, and dehumanization stress the importance of implementing technology in ways that uphold justice, human rights, and rehabilitation (Imandeka et al., 2024b). In addition, security-focused prison policies can hinder the adoption of internet and digital services for incarcerated individuals, complicating their preparation for release and re-entry (Jewkes & Reisdorf, 2016). Lack of access to digital services can marginalize a person from wider society, causing a digital divide (Reisdorf & DeCook, 2022; Reisdorf & Rikard, 2018). Prisons have not been digitized at the same pace as the society outside their walls, resulting in challenges related to the digital inclusion of incarcerated and recently released individuals (see Jewkes & Reisdorf, 2016; Knight et al., 2024). As such, Knight et al. (2024) contend that responsible digitization in the criminal justice system must recognize the crucial role of technologies and individuals' digital skills in supporting desistance, reintegration, and access to education and employment in an increasingly digital society.

In this study, we examine the digitalization of prisons and its perceived meanings using the concept of smart prison. This is a new prison concept that focuses on supporting the rehabilitation, education, and social integration of incarcerated people using digital services (Imandeka et al., 2024a). The concept also refers to an integrated system for management and data analysis, providing real-time insights and operational awareness (Imandeka et al., 2024b).

This research focuses on the Finnish context. Finland is a digitally advanced country, with high levels of digital development and digital skills among citizens even by European standards (e.g., European Commission, 2022) and mature prison technology (Knight et al., 2023). We explore the views of incarcerated women on the significance of the smart technology in use to support digital inclusion and reintegration into society. In 2023, women constituted about 8% of the Finnish prison population (N = 256; average age 39.8 years), mainly (39%) convicted of violent offences and with a recidivism rate of 45% (Prison and Probation Service of Finland [PPSF], 2023b). Incarcerated women face numerous social and health-related challenges as well as complex support needs. Accordingly, examining their digital inclusion is pertinent.

1.1. Finnish Smart Prison as a Research Subject

In smart prison development, two main trends can be distinguished (McKay, 2022): One emphasizes security, while the other highlights the benefits of digitalization for incarcerated people. In addition,

Imandeka et al. (2024b) distinguished several approaches in smart prison discourse, such as rehabilitation, security, streamlining administrative processes, and the smart prison as an entity. The rehabilitation approach emphasizes education, reintegration, and maintaining social ties (Järveläinen & Rantanen, 2024; Reisdorf & Rikard, 2018). In contrast, the security approach focuses on surveillance technologies, while the administrative view emphasizes operational efficiency (e.g., Järveläinen & Rantanen, 2024, 2026; Knight et al., 2023). Finnish smart prison development prioritizes incarcerated people's rehabilitation and inclusion, while also integrating advanced security technologies and modern prison design. The model integrates these approaches into a unified system promoting safety, rehabilitation, and streamlined processes.

One of the stated objectives of the Finnish smart prison model is the principle of normality, which emphasizes that incarcerated individuals should have access to the same services as people outside prison (Puolakka, 2021). This premise aligns with the Nordic discourse on the digitalization of prisons (Smith, 2013; Toreld et al., 2018). Underpinning this approach is the Nordic tradition of moderate criminal policy, which reflects the values of equality and universality characteristic of the Nordic welfare state model (see, e.g., Lappi-Seppälä, 2012). The idea is that incarcerated people retain all the same rights as individuals outside prison, with the sole exception of their liberty (e.g., Engbo, 2017; see also the critical ethnographic analysis of the Nordic ideal of normality in practice in Shammas, 2014).

The development of smart prisons often aims to increase efficiency, which can reduce human interaction, leading to the risk that automation increases isolation (e.g., McKay, 2022). Finland, however, has taken the opposite approach by emphasizing human-centered work in prisons, where advanced smart technology and face-to-face work are interconnected. The PPSF strategy emphasizes an interactive, coaching-based professional approach to supporting the rehabilitation and reintegration of incarcerated individuals (PPSF, 2024). Staff play a central role in motivating incarcerated people to live crime-free lives through everyday interaction and support (Ylisassi et al., 2016), which also facilitates digital inclusion and societal re-entry (Järveläinen & Rantanen, 2024, 2026). The strategic orientations adopted in Finland are also consistent with previous prison research that has highlighted the central importance of the staff–prisoner relationship to prisons' organizational culture (Knight et al., 2023; see also Crewe et al., 2023; Liebling et al., 2011), as well as the influence of digitalization on interactions between incarcerated individuals and prison staff (Järveläinen & Rantanen, 2021; Knight & Van De Steene, 2017), and on the overall prison atmosphere (Knight, 2015).

The Finnish smart prison is a socio-technical system which involves more than the mere introduction of ICT into the prison environment. It was developed through the *Älykäs vankila* (smart prison) project (2018–2022) which aimed to create rehabilitative and educational prison environments that support crime-free lives. Finland's smart prison initiative began with a women's prison in 2021 and expanded to two male prisons by 2023 (PPSF, 2023a; Puolakka, 2021), but growth has since stalled due to economic constraints. In practice, smart prison uses advanced technology in several daily operations, including surveillance, communication, and rehabilitation. In the Finnish smart prison under study (a high-security closed prison for women), each cell is equipped with a personal laptop, granting incarcerated women controlled access to digital services, educational materials, and self-help programs. In other Finnish high-security closed prisons (n = 14, men), laptops are shared devices whose use is permission-based and closely supervised. In contrast, low-security open prisons (n = 1, women; n = 11, men) allow incarcerated individuals to use their personal computers and smartphones more freely, for example for educational purposes. Alongside prison modernization, the PPSF updated its client system, Roti.

1.2. Incarcerated People's Digital Inclusion

We examine the use of the internet and digital services by incarcerated people through the lens of digital inclusion. This concept emphasizes the social nature of digital technology use and encompasses the digital divide (van Dijk, 2020) and social inclusion (Helsper, 2012, 2021). Digital inclusion refers to various activities that are needed to ensure all people have access to and can use ICTs, including the most disadvantaged (see Reisdorf & Rhinesmith, 2020), and it can be approached from the perspective of the resources available to the individual (e.g., Helsper, 2008, 2012). Helsper's (2008, 2012, 2021) corresponding fields model situates digital inclusion within the context of economic, social, cultural, and personal inequalities, showing how differences in access, skills, attitudes, and engagement both reflect and reproduce offline disadvantages, particularly among multiply disadvantaged groups such as incarcerated individuals (see Reisdorf & Rikard, 2018), while highlighting the role of unequal resources and usage opportunities in shaping participation and outcomes. Complementing this, van Dijk's (2020) cumulative model describes digital inequality as a process in which disparities in access, motivation, skills, and use reinforce one another over time, especially in contexts such as incarceration, where digital trajectories are disrupted. In particular, various vulnerable groups such as incarcerated people (Reisdorf et al., 2022; Reisdorf & Rikard, 2018) face digital inclusion challenges.

The digital inclusion of incarcerated people has been studied from the perspectives of rehabilitation and successful re-entry (Reisdorf et al., 2022; Reisdorf & Rikard, 2018) and e-learning (Barreiro-Gen & Novo-Corti, 2015). These studies have identified similar categories of digital resources as studies on digital inequality among other population groups, in particular highlighting the importance of digital skills, related training, and internet access (Reisdorf & DeCook, 2022). Prison studies have also found challenges to privacy (Robberechts, 2020; Seo et al., 2022) and a lack of trust (Järveläinen & Rantanen, 2021).

Incarcerated women are a particularly marginalized group with various risk factors for digital exclusion. For example, many incarcerated women have complex trauma histories and multiple mental health diagnoses linked to early-life adversity, power abuse, and victimization (e.g., Crewe et al., 2023; Jewkes et al., 2019). Trauma has also been identified as a contributing factor to recidivism among incarcerated women (Lehrer, 2021). Consequently, incarcerated women have diverse needs in terms of accessing various digital social and healthcare services (Järveläinen & Rantanen, 2024). However, they are a heterogeneous group with contrasting attitudes towards ICT (Seo et al., 2022), which poses challenges with regard to engagement with digital services. Digital inclusion in prisons is not gender-neutral, as women's experiences are shaped by intersecting inequalities, such as gender, social class, and ethnicity (Hopkins, 2022). In addition, among incarcerated women, deficits in digital skills and the digital divide appear particularly deep, increasing their risk of social exclusion and limiting their access to the labor market (Cuevas-Cerveró & Agúndez Soriano, 2019; see also Seo et al., 2022).

The relationship between digital and social inclusion in prison is more complex than in wider society because prison rehabilitation is linked to two very different social contexts. The digital rehabilitation and reentry model proposed by Reisdorf and Rikard (2018) examines digital inclusion in relation to both the prison realm and the reentry realm. According to this model, the significance of digital skills for an incarcerated person is twofold: They are a prerequisite to use digital services and maintain online communication with loved ones during imprisonment, and also an essential civic skill in a digital society. Adequate digital skills promote employment and indirectly also reduce the risk of recidivism (Zivanai & Mahlangu, 2022).

Restrictions on internet access in prisons are a key barrier to internet use by incarcerated people, and thus to their learning of digital skills essential for the digital era during their imprisonment (Jewkes & Reisdorf, 2016; Knight, 2015; Reisdorf & DeCook, 2022). Digital skills refer to the operational, informational, communicative, and strategic abilities needed to use digital technologies effectively and are central to digital inclusion, which involves both access to technology and the capacity to use it meaningfully (van Deursen et al., 2012). Such restrictions are primarily driven by a security-oriented mindset that sees internet use as a potential risk rather than an opportunity for rehabilitation and successful reintegration into society (Jewkes & Reisdorf, 2016). They are also partly due to the resistance to change inherent in prison culture (Knight et al., 2023). As such, we assume that examining the digital inclusion of incarcerated people and its significance for rehabilitation and re-entry requires consideration of the social context of prisons. In this study, we examine the digital inclusion of incarcerated women in the context of a Finnish smart prison.

2. Method

2.1. Research Questions

In this study, we examine the Finnish smart prison from the perspectives of incarcerated women. We ask:

1. How do incarcerated women perceive the significance of the smart prison?
2. What are the main prerequisites for and challenges to digital inclusion within the Finnish smart prison?
3. What specific characteristics are associated with the Finnish smart prison concept?

2.2. Data Collection Method and Instruments

The two-year fieldwork included data collection using elements characteristic of ethnographic approaches (see, e.g., Crewe, 2018; Ugelvik, 2014) and qualitative attitude approaches (Peltola & Vesala, 2013; Vesala & Rantanen, 2007). The qualitative attitude approach is a discourse-oriented research approach that, in addition to a general perspective on the argumentative nature of everyday speech, also includes clear methodological procedures. The approach is based on Billig's (1987) rhetorical psychology, which explores how people use argumentative talk to construct social realities. Such speech can be prompted in interview situations using pre-formulated statement-type questions. Interviewees are asked to take a stance on the presented statements and justify their positions, as well as to provide practical examples to support their justifications. The study was conducted during the Covid-19 pandemic, which, along with security restrictions, limited access to the prison. Nevertheless, an ethnographic approach that is uncommon in Finland was adopted, combined with a two-year follow-up design. On-site observation days were carried out by one researcher, which included informal interactions with staff and incarcerated women, as well as scheduled interviews. The observations focused on the implementation of in-cell laptops, the interaction between prison staff and incarcerated women, and how these factors influenced practices and the atmosphere.

The formulation of the interview statements and themes was based on the concept of the smart prison as a socio-technical system, as well as on the assumption that digital inclusion during imprisonment is linked to social inclusion and re-entry. The interviews explored themes such as the introduction of in-cell laptops, the impact of digitalization on prison practices and relationships, and its potential to promote reintegration and crime-free lives. They included several open-ended questions about incarcerated women's digital skills,

use of society's digital services and prison in-cell laptops, as well as their needs for digital support, and three statements. In this article, we focus on these three statements:

> Statement 1: The prison's digitalization has significantly changed the prison's operating methods and the client–staff relationship.
>
> Statement 2: The digitalization of the prison significantly eases re-entry into society and desistance from crime.
>
> Statement 3: The smart prison serves as a learning environment where a person can learn the skills needed for a crime-free life during imprisonment.

The statements are expected to provide insights into how incarcerated women perceive the significance of the smart prison, as well as the key prerequisites, challenges, and defining characteristics associated with digital inclusion in the Finnish smart prison. Comparative results (including employee data) on these statements are reported in other articles (Järveläinen & Rantanen, 2024, 2026).

2.3. Participants

This article focuses on interviews conducted with 12 incarcerated women. The researchers aimed to find interviewees of various ages who had used the in-cell laptop, even minimally, for internal prison communication and to maintain contact with external parties during their incarceration. Their ages ranged from 25 to 54 (average 35.7), and they had been in prison between one and seven times (of whom six were serving their first sentence). The educational backgrounds of the interviewees varied from basic education to vocational training, with some having completed higher education.

2.4. Procedure

After obtaining the necessary research permission and approvals, the practical arrangements for the study were agreed with the prison director. To minimize selection bias (see, e.g., Jewkes, 2014), the director was asked to appoint an employee who had in-depth knowledge of the incarcerated women but limited authority over them. An appointed employee from the prison's social work and rehabilitation services disseminated an open call across all prison wards to eligible individuals from diverse backgrounds, and all volunteers recruited through this staff-mediated process were included in the interviews. The female researcher from the research team conducted the fieldwork.

Observation days were also separately agreed upon with the prison director, and the prison staff on duty were informed of the researcher's presence in the facilities. The researcher was granted permission to move around the facilities at agreed times to familiarize themselves with the premises and engage in informal discussions with prison staff. In addition to formal interviews, the researcher held informal meetings with various staff members to understand their perspectives on the impact of in-cell laptops over a two-year period. All meetings were organized in a way that did not disrupt the prison's basic operations or burden staff. Visits to the wards and informal conversations with incarcerated women were always separately agreed upon with the staff working in the wards.

The study (2021–2023) consisted of 10 observation days and a total of 37 interviews with 12 prison staff members and 12 incarcerated women, whom we interviewed one or two times each in a follow-up design. In this article, we focus on the interviews with incarcerated women, of whom three were interviewed twice, and nine only once (for a total of 15 interviews). The duration of the interviews ranged from 26 to 66 minutes (average 44 minutes). Fourteen of the interviews were conducted in the prison during observation days in a private meeting room, with only the interviewer and interviewee present. One interview was conducted via video call.

2.5. Analysis

Prior to analysis, the data were transcribed and pseudonymized using fictitious names, and selected quotations were translated by the researchers, with efforts to preserve the interviewees' original expressions and meanings. The analysis and writing phases were conducted as a reflexive process by the research pair. The analysis of the material was carried out in accordance with qualitative attitude research (Peltola & Vesala, 2013; Vesala & Rantanen, 2007), which is conducted in two phases: classification and interpretative analysis. In the first classification phase, we paid attention to whether the interviewees agreed or disagreed with the statement or took a reserved stance. Additionally, we analyzed their justifications for their positions and how these justifications were distributed among the different stances.

Regarding Statement 1 ("the prison's digitalization has significantly changed the prison's operating methods and the client–staff relationship"), positive stances (n = 10) were justified by emphasizing that electronic transactions have accelerated communication within the prison and the handling of personal matters, as well as facilitated contact with family and other authorities. Interviewees who took a reserved stance (n = 5) supported their positions by emphasizing that the change was not considered significant, as paper forms were still used. Regardless of the stance taken, client–staff relationships with prison personnel were perceived positively by all interviewees.

Statement 2 ("the digitalization of the prison significantly eases re-entry into society and desistance from crime") divided the interviewees' opinions. Justifications for an opposing stance (n = 7) stressed that digitalization had no impact on desistance from crime and access to digital services was limited. Interviewees who took a reserved stance (n = 6) highlighted that increased access to and independent use of digital services during imprisonment could aid re-entry to society. Justifications for a positive stance (n = 2) emphasized that learning digital skills and use of digital services in prison would enable smoother re-entry into society.

Statement 3 ("the smart prison serves as a learning environment where a person can learn the skills needed for a crime-free life during imprisonment") also divided interviewees' opinions. Justifications for a reserved stance (n = 7) highlighted that digitalization supports rehabilitation, work, training, and communication with staff. Justifications for a positive stance (n = 7) emphasized that learning digital skills and maintaining digital agency were essential for reintegration into a digital society and a crime-free life. One opposing stance (n = 1) was justified with arguments concerning restricted access to education, the lack of gradual release mechanisms, and the stereotyping of incarcerated women, all of which hinder societal integration and individual transformation.

Interpretive analysis drew on the entire dataset (addressing the three statements) and followed an abductive approach, which integrates inductive reasoning with deductive logic (see Timmermans & Tavory, 2012). Data, initially structured through statement-based classification, were examined through a theory-driven lens informed by Helsper's (2008, 2012) model of digital inclusion, which highlights the central roles of access, digital skills, and motivation and attitudes. Subsequently, data were analyzed inductively, leading to the identification of additional factors that both enable (e.g., interaction) and constrain (e.g., security restrictions) digital inclusion. Next, the classification was further refined and consolidated, resulting in a final analytical framework comprising the following thematic categories: Incarcerated women's digital skills as a basis for digital inclusion; restrictions on access to the internet and digital services challenge incarcerated women's digital inclusion; and the combination of digitalization and interactive organizational culture supports rehabilitation and re-entry. In the results section, we present the findings by integrating fieldwork observations and the thematic categories derived from the interview data into a coherent whole.

2.6. Ethical Questions

The study followed Finnish National Board on Research Integrity (2019) guidelines. Ethical approval was obtained from the university's ethics committee, and research permission was granted by the PPSF. Throughout all phases of the research process, special attention was paid to the autonomy, anonymity, and voluntary participation of the interviewed incarcerated women. The interviewees showed great interest in our research topic, and all those who were willing were offered the opportunity to participate in our follow-up study. Only the researcher and interviewee were present during interviews. As researchers, we acknowledge the key challenges posed by prison ethnography, including the importance of positionality, gender, and ethics, as well as the need for sensitivity when studying incarcerated women (Jewkes, 2014; Ugelvik, 2014). The female researcher who conducted the fieldwork earned the interviewees' trust through respectful interactions, while also recognizing constraints in terms of anonymity and shifting roles, which required ongoing negotiation within the prison's power relations (Ugelvik, 2014).

3. Results

3.1. Digital Interaction as Part of Daily Life in the Smart Prison

The smart prison under study opened in the fall of 2020, and in-cell laptops were introduced in early 2021. In the initial phase of the fieldwork, we observed the prison's architecture and geographical location, as well as the calm and positive atmosphere. The facility is located near a forest area, with cell windows providing a view of the yard. All prison windows were barless. The prison has eight wards (with 12 one-person cells per ward) with their own dining areas and outdoor spaces. All individual cells are equipped with a built-in laptop, television, bed, sofa, shower, storage space, and coffee machine. Common areas in the prison include a chapel, library, salon, sewing room, gym, family rooms, and an outdoor area for supervised exercise. The prison uses advanced technology for monitoring and to lock the doors of the wards and cells, in addition to the in-cell laptops.

During the early stages of the fieldwork, the introduction of the in-cell laptops faced various operational challenges, which were gradually overcome by the end of the follow-up phase. In-cell laptops enabled daily communication between incarcerated women and prison staff, submission of electronic forms, calendar use,

canteen orders, bank account checks, and access to news, music, and audiobooks. In-cell laptops had restricted access to permitted websites. Through the Portti portal, incarcerated women could explore rehabilitative services for use during and after incarceration. It also allowed users to view documents stored on the server related to education, training, leisure activities, and prison bulletins. Digital interaction added versatility to communication and improved work efficiency, allowing quick handling of practical matters. The chat function facilitated daily communication, replacing many ward visits and freeing up staff time for more personalized meetings. The in-cell laptops were available during the day and in the evening and were turned off at night.

It was also possible to connect via video call with prison staff (e.g., social worker, psychologist, pastor, or nurse) and, under supervision, with various external authorities. These contacts aimed to promote the handling of personal matters by incarcerated women, supporting their re-entry into society. Every Saturday, video calls with family members and friends were allowed. These video calls were subject to permission and supervision. The interviewees felt that meetings with relatives through the in-cell laptop without the presence of other incarcerated people were meaningful. Video calls played a particularly crucial role during the Covid-19 pandemic when prison operations were in lockdown.

Most interviewees felt that digitalization has significantly changed the prison's operating methods and the client-staff relationship, diversifying communication methods and enabling better contact with both relatives and other authorities. However, some felt that the change has not been significant, as paper forms were still used alongside digital ones, and encounters with staff were generally considered functional. Overall, the interviewees emphasized that digital tools have facilitated daily communication. They particularly noted that contact with prison staff faced significantly lower barriers, bringing them closer. Additionally, electronic forms were seen as more reliably reaching their recipients than paper forms. This was seen as a factor contributing to a serene prison atmosphere.

3.2. Incarcerated Women's Digital Skills as a Basis for Digital Inclusion

Based on our fieldwork and interviews, digital skills appear to be a key factor in the digital inclusion of incarcerated women. Interviewees highlighted that digitalization in general and especially the use of in-cell laptops enabled the learning of digital skills in prison. Also, the use of digital services facilitated reintegration into society, provided that their use was comprehensive and independent. In addition, they argued that learning digital skills and maintaining digital agency facilitates living a crime-free life and re-entry into a digital society.

Younger interviewed women (aged 20–40) generally described having good digital skills and actively using online services before imprisonment, such as booking appointments or shopping. Older interviewed women (50+) often described lacking digital skills and confidence, preferring face-to-face interactions, and avoiding digital tools. They relied heavily on family members to manage digital transactions, and this was emphasized during imprisonment.

Incarcerated women valued guidance that enabled independent action, noting that staff doing tasks for them created uncertainty and reduced confidence. Many interviewees stressed the importance of maintaining and developing digital skills during imprisonment to navigate and survive in digital society. Given their fears and reluctance to use digital tools, support from prison staff was key in overcoming barriers:

> Of course it's difficult, the banking systems and all that, you know, because you still have to do it through the social worker….It's good that the social workers are here helping as well, so that if you don't know everything on the computer, they can help with how to do those things from your in-cell laptop. (Siiri, 38 years)

The interviewees highlighted that it was crucial to learn to use digital devices independently to maintain a crime-free life in the future. This would enable them to secure housing, employment, or education, or to apply for social assistance to ensure their livelihood in society:

> Here, for people who have been without any contact with information technology for years, the world has changed. On our ward, there's someone who has been incarcerated since 2009, and the world has significantly shifted towards digitalization, where everything is handled electronically. Here, when you get the foundation and learn to handle things electronically, it's easier when you're free. And when you already know how to apply for support, school, or work, it certainly helps in disengaging from criminal behavior. You won't commit crimes for money or…like that. At least that's how I see it. (Oona, 27 years)

All in all, interviewees' digital skills and attitudes towards digital services appeared to significantly affect digital inclusion and the reintegration of incarcerated women into a digital society. The lack of digital skills highlighted the need for digital support. On the other hand, the data strongly indicated a desire to act independently in managing personal affairs, which supports thriving in a crime-free life within a digitalized society.

3.3. Restrictions on Access to the Internet and Digital Services as Challenges to Incarcerated Women's Digital Inclusion

Interviewees who expressed critical opinions emphasized that digitalization had no impact on desistance from crime because access to digital services during imprisonment was restricted. They also pointed out that incarcerated women were often associated with incorrect stereotypes, which in turn was seen as preventing the possibility of life change.

Firstly, the interviewees highlighted challenges related to studying during incarceration. Only basic or high school education was possible, as this took place in a closed internal online prison learning environment with other incarcerated individuals. Although the learning environment enabled interaction with other students, such forms of study were prohibited for security reasons.

Furthermore, interviewees raised challenges related to strong identification requirements to use digital services outside prison. Because the electronic IDs of incarcerated individuals were held by prison staff, the possibility of independent digital interaction was necessarily limited, which forced them to rely on others to access services.

> It would significantly help….Well, we don't have bank IDs or any login credentials for anything, so we can't do anything without social workers. Basically, when everything requires logging in, even just looking for housing….There are those housing sites where you can browse and blah blah blah, and it's a huge hassle for us. We have to add phone numbers to the system and remove old ones, and we can't send any instant messages to anyone outside. I argue that this computer doesn't help with that

> because we can't manage our own affairs. We can't handle any of our own matters. We can call home to mom and hope she takes care of things for us. Like that. If we had bank credentials in our own hands, then we could possibly handle something ourselves. (Lilja, 38 years)

Additionally, the in-cell laptop only permitted information searching on a limited selection of white-listed websites, and interaction with these sites was disabled. The limited features of the in-cell laptop caused frustration among the incarcerated women:

> Well, I don't understand how such a digital system, basically designed for children, would help when you go out there where normal internet connections and regular things are in use. Like here, most people, like applying for housing, many start looking for apartments five years in advance, for example. And then all those things like Kela [the Social Insurance Institution of Finland] and such, I don't know how they work, because they probably require some kind of identification….Yes, so that wouldn't work, as those things are still done somewhere with the help of an official and probably even on paper. There aren't….There aren't any identifiers available for personal use. (Alma, 54 years)

Overall, according to interviewees, access to external services, such as remote rehabilitation or education, was highly restricted in prison. This, in turn, was seen as limiting their ability to succeed in a future digital society.

3.4. Digitalization and an Interactive Organizational Culture as Support for Rehabilitation and Re-Entry

Interviewees emphasized that prison activities, such as education, work, and rehabilitation programs, were vital for learning life skills and preparing for a crime-free future. Digital tools were seen as complementary to established offline activities, especially during the Covid-19 pandemic, when the external services of various NGOs were delivered via in-cell laptops. These digital services helped maintain continuity in rehabilitation and build bridges for reintegration into society.

The fieldwork revealed the importance of social interactions between incarcerated women and prison employees in daily life and rehabilitation efforts in the studied smart prison. Encounters were immediate and mostly respectful, and conversations were colored by humor, which also helped build mutual trust. One incarcerated woman emphasized the importance of these encounters as follows:

> For me, those [encounters with employees] are important. I visit the psychologist, and then there are these [employees responsible for social work and rehabilitation], rehabilitative courses and such. I've talked to many prison officers, because I have nothing to hide; I've openly shared everything—why I'm here, how I've been exploited, manipulated, threatened. All these things. Many prison officers have said that if you have something, they are there to support you, that you can come and talk to them about these things, and they will listen. And it's really important to me to have that support around me here, because without it, I don't know how well I would manage. (Siiri, 38 years)

Instead of reducing human contact, the introduction of ICT actually enhanced face-to-face interactions. According to our findings, this combination of ICT use and face-to-face social interaction is one of the key features of the studied Finnish smart prison, alongside a focus on rehabilitation and preparation for release.

Over the years, Finnish prisons have gradually shifted to a more rehabilitative and interactive approach, and new facilities and rehabilitative activities have accelerated this development. One incarcerated woman with a long prison history described prisons' cultural shift as follows:

> As I mentioned before, the previous prison culture had a huge wall with staff on one side and prisoners on the other. If you started talking to a prison officer [PO] back then, there was immediately an angry ward behind you, waiting to see what you were explaining. There was no small talk with the staff….It usually meant that someone was snitching or complaining about someone or trying to cause problems for someone….There couldn't be any casual talk about everyday world politics. No one talked about that. It was like that until a few years ago. Still is in most prisons. But when they [the Training Institute for the PPSF] started this interactive PO training program, at first people wondered why someone would sit for an hour with a PO in a room. But as it happened more often, people realized that this was part of the POs' training program. The situation started to change. And now, at least here in this prison, at least in our ward, it's completely logical, normal, and acceptable that you can talk about everyday world politics with a PO. No one has to wonder what you're talking about. (Alma, 54 years)

The above excerpt describes a shift in Finnish prison culture toward a more rehabilitative atmosphere. A key driver of this change is the updated training for Finnish prison officers, which now emphasizes interactive engagement. Incarcerated women noted they can now talk casually with prison staff without fear of being labeled as a 'snitch.' Interviewees also highlighted how the new modern smart prison environment, compared to older facilities, supports this more positive and respectful interaction culture.

The material revealed that not all employees had yet adopted the new interaction culture, with "some still clearly wanting to show their own power position, that they are prison officers, and we are prisoners" (Anni, 34). Incarcerated women stressed that prison staff behavior directly affects their rehabilitation, with respectful and supportive interactions playing a key role. The rehabilitative and coaching-based approach taken by the employees helps them reassess their values and desist from crime:

> It all depends on how it's implemented; it's up to the employees. If the employees are ready to meet us as humans and not act like a punishment institution, that we're not in a punishment institution but are rehabilitating, then both the smart prison and the regular prison function as learning environments. If we start going down the path of being punished here, that the loss of freedom is the punishment, and if we start getting extra punishment, then we quickly take steps backward. A person starts to defend themselves, and then comes the counter-reaction. If I'm treated like a criminal, I'll start behaving like a criminal. But if I'm encouraged to learn other survival skills, it supports the possibility that there won't be a second time. (Anni, 34 years)

Overall, the study concluded that a prison that combines advanced technology with a rehabilitative and interactive approach can serve as a learning environment for a crime-free life. The Finnish smart prison aims to combine these elements, but progress is gradual.

4. Discussion

4.1. Main Findings

The present study highlights the main prerequisites for and challenges of digital inclusion for incarcerated women, but also some special features of the Finnish smart prison concept. Firstly, the study indicates that the digital transformation and, in particular, the introduction of in-cell laptops significantly transformed the operating culture of the prison under study, streamlining both internal and external communication processes and also strengthening the interaction between incarcerated women and prison staff. Secondly, the digital skills of incarcerated women and their willingness to use digital services are fundamental for the achievement of digital inclusion. Thirdly, restrictions on access to the internet and digital services pose challenges to the digital inclusion of incarcerated women, highlighting the role of prison staff as enablers and gatekeepers. Fourthly, the study reveals a key characteristic of the Finnish smart prison: That the rehabilitative approach combines with ICT and interactive and humane practices by staff to support the development of prison conditions.

4.2. Experiences of Incarcerated Women in a Smart Prison

In the Finnish smart prison system, several technological advancements have been implemented to support incarcerated women's digital activities and rehabilitation. In-cell laptops provide access to internal prison services and, to a limited extent, external public services and the internet. These devices also enable video calls, although such interactions are subject to prior authorization. The present study revealed both the positive and negative experiences of incarcerated women regarding the smart prison and the usability and usefulness of digital technology. Consistent with previous studies, the research highlighted that the possibility of using digital services and engaging in digital interaction can streamline internal processes within the prison and support the rehabilitation and re-entry of incarcerated individuals into society (Imandeka et al., 2024a; 2024b; Knight et al., 2023; Knight & Van De Steene, 2017). The digitalization of prison services can also contribute to a more constructive and supportive institutional atmosphere (see, e.g., Crewe et al., 2023). In interviews, however, some incarcerated women expressed frustration over the limitations imposed on digital access, indicating that restrictive policies can significantly reduce the benefits of technological development. This finding is in line with previous studies (e.g., Barreiro-Gen & Novo-Corti, 2015; Jewkes & Reisdorf, 2016; Knight et al., 2023).

4.3. Barriers to Digital Inclusion

The prerequisites for and challenges of digital engagement identified in the study are largely consistent with Helsper's (2008, 2021) model and previous research on the digital inclusion of incarcerated individuals (Reisdorf et al., 2022; Seo et al., 2022). A significant barrier is the limited digital literacy of some incarcerated individuals, which restricts their ability to effectively utilize available technologies. Additionally, negative attitudes and apprehensions toward digital services persist among certain incarcerated women, further complicating efforts to promote digital engagement. These challenges are further embedded in broader socio-cultural dynamics, as women's digital inclusion in re-entry is shaped by gender, age, and identity factors which influence their ability to adapt to and engage with digital society (Reisdorf & Rikard, 2018; see also Helsper, 2012).

Access remains a critical issue, as internet connectivity is tightly controlled and services requiring strong electronic identification are often inaccessible to incarcerated women. Digital skills and positive attitudes toward technology are essential for the digital inclusion and successful re-entry of incarcerated women. Overcoming these challenges to the digital inclusion of incarcerated women is important because digital interaction offers opportunities to manage housing, employment, education, and rehabilitation (see, e.g., Barreiro-Gen & Novo-Corti, 2015; Passey et al., 2018; Reisdorf & Rikard, 2018), potentially reducing recidivism (McDougall et al., 2017). In line with these challenges, our study indicates that, despite the provision of in-cell laptops, access to digital services remained highly restricted and institutionally mediated, thereby challenging the realization of digital inclusion.

Previous studies emphasize the importance of support and digital skills training (Reisdorf et al., 2022). Our findings show that access to external services, remote rehabilitation, and higher education are significantly limited due to security concerns. These services are accessed under staff supervision, highlighting their role as both gatekeepers and enablers (Jewkes & Reisdorf, 2016; Robberechts, 2020; Seo et al., 2022). However, many interviewees expressed a strong desire for independence in managing personal affairs, which fosters self-efficacy and supports a crime-free life in a digital society. Accordingly, greater emphasis should be placed on enabling independent digital engagement and providing adequate digital support to strengthen digital competencies and facilitate successful re-entry (Järveläinen & Rantanen, 2024, 2026; Reisdorf & Rikard, 2018; van Deursen et al., 2012).

4.4. The Finnish Smart Prison Model Promotes Rehabilitation and Re-Entry

The study identified several characteristics of the Finnish smart prison model that distinguish it from traditional correctional facilities and many other smart prisons. From an international perspective, the Finnish smart prison clearly represents a trend that focuses on rehabilitation, social inclusion, and the benefits received by incarcerated individuals (Fedorczyk, 2024; McKay, 2022). However, the Finnish model does not emphasize the adoption of isolated digital solutions in the prison environment as much as it does the comprehensive development of the smart prison, which also includes security technology and the prison as a social environment.

Although many processes have been streamlined and new surveillance technology has been introduced as part of the development of smart prisons, the goal of their development is not to completely optimize processes or create the "carceral automaton" described by McKay (2022, p. 101). On the contrary, the Finnish model emphasizes the importance of interactive work, with digital tools used in conjunction with face-to-face interactions to foster humane and meaningful social interaction between staff and incarcerated women. In line with previous prison studies (Crewe et al., 2023; Ylisassi et al., 2016), this study found that interactive encounters can promote rehabilitation and security. In Finland, the PPSF's strategy emphasizes coaching approaches to guide incarcerated individuals towards a crime-free life (Ylisassi et al., 2016). The prison under study demonstrates the cultural shift occurring in Finnish prisons, emphasizing humane interaction between incarcerated women and prison staff.

The development of the Finnish smart prison is grounded in the principle of normality (Puolakka, 2021), which emphasizes that prison conditions should correspond as much as possible to conditions outside prison (Engbo, 2017; Smith, 2013; Toreld et al., 2018). This includes equal access for incarcerated individuals to the internet

and digital services, unless specific restrictions are justified (Smith, 2013; Toreld et al., 2018). However, the findings show that this principle is only partially implemented in the prison studied due to ongoing limitations on internet use and digital services. Despite these restrictions, the design and development of smart prison facilities clearly aim to create an environment that aligns with everyday societal conditions.

Although the Finnish smart prison model has many strengths in terms of supporting the rehabilitation of incarcerated individuals and facilitating their return to society, its development and expansion have been hindered by the same challenges identified in previous studies. In particular, technological challenges in the early stages, gaps in digital skills and training, and emphasis on a security-oriented mindset (see, e.g., Jewkes & Reisdorf, 2016) have emerged as factors slowing down development (see Imandeka et al., 2024a, 2024b). In recent years, challenges related to costs (see Imandeka et al., 2024a) in particular have hindered the introduction of new smart prisons in Finland. Due to financial constraints, the number of in-cell laptops has been reduced, and a system of shared use across all three prisons has been implemented. In the future, it will be important to study the impact of smart prisons on recidivism rates, as well as to compare prisons with different technological solutions (smart prisons versus prisons with shared computer terminals).

4.5. Limitations

This study examined a single Finnish prison during the early stages of advanced technology implementation, coinciding with the Covid-19 pandemic and the opening of a new facility, which posed challenges to the research and technology deployment. As digitalization in prisons is a long-term process, the findings are specific to the initial phase. The prison served as a digitalization pilot, with interviewees generally positive about digitalization despite some criticism regarding technology malfunctions and learning new systems. Furthermore, the Covid-19 pandemic may have influenced the findings by increasing reliance on digital tools, potentially limiting generalizability. The study is further constrained by the small sample size, a single-site design, and a possible selection bias stemming from recruitment through a prison-appointed contact person. However, the triangulation approach provided a deeper understanding of the data and phenomenon. The analysis, based on interviews and field observations, reflects the real situation regarding technology use and its challenges in the prison.

5. Conclusion

This study underscores the transformative potential of digital technologies in correctional settings, particularly within the Finnish smart prison model. The integration of in-cell laptops and other ICT tools has significantly reshaped the operational culture of the prison under investigation, enhancing both internal communication and the rehabilitative interaction between incarcerated women and prison staff. These developments reflect a broader shift toward a more inclusive and humane correctional environment, aligned with the principle of normality. However, the findings also reveal barriers to full digital inclusion. Limited internet access, insufficient digital literacy, and restrictive security policies continue to constrain the benefits of technological advancement. While incarcerated women generally expressed a willingness to engage with digital services, their ability to do so independently remains limited. This highlights the dual role of prison staff as both enablers and gatekeepers of digital engagement. At a general level, the findings suggest potential benefits of the smart prison concept; however, as they are based on a single case study, they should be interpreted with caution and require further research across diverse contexts. Digital inclusion

during imprisonment facilitates smoother reintegration into an increasingly digitalized society. The digital skills acquired and maintained during incarceration may contribute to enhanced digital and social inclusion following release.

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Conflict of Interests

The authors declare no conflict of interest.

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