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Caring networks for digital inclusion: how network weaving transforms responses to digital inequalities

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ABSTRACT

Digital inequalities persist despite extensive policy and research efforts aimed at expanding access, skills, and technology use. Prior research has focused mainly on techno-centric, top-down interventions, which have been limited in their success due to their lack of relational, context-sensitive engagement. This study conceptualises digital inclusion work as care work to address digital inequalities. Drawing on the Ethics of Care and Network Weaving frameworks, we examine how digital inclusion networks mobilise relationships and collective action. We present a paradigmatic case study of an exemplar digital inclusion network in northern England and show how the network's effectiveness lies in its ability to build and sustain nurturing relationships among diverse but aligned organisations. Our findings identify four interlocking mechanisms, caring about, caring for, caregiving, and care-receiving, through which Network Weaving principles enable the network to operate as a network of care. These mechanisms reinforce one another cyclically, with care-receivers re-entering the network as caregivers themselves, sustaining a collective, rather than individually delivered, process of digital inclusion. By framing digital inclusion work as care work, our study advances theoretical understanding of how relational infrastructures enable more transformative responses to digital inequalities.

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1. Introduction

The historical framing of digital inclusion has often been confined to the narrow concept of the digital divide, a binary model focusing on 'haves and have-nots' in terms of physical access to computers and the internet (Nemer, 2022). For decades, public access venues (PAVs), such as telecentres and community technology centres, were positioned as the primary response, premised on the idea that shared access to technology would itself drive empowerment and capacity building (Bailur, 2007; Best et al., 2009; Nemer, 2022; Sey et al., 2013; Vannini et al., 2013; Vannini, Rega, & Cantoni, 2015). Yet this history is also marked by significant, recurring failure, often attributed to a design-reality gap in which top-down, techno-centric models failed to account for local dynamics, leading to underutilisation and collapse once external funding ceased (Bailur, 2007; Chigona et al., 2011; Heeks, 2002; Rao, 2008; Vannini, Rega, Sala, et al., 2015).

These persistent challenges have catalysed a shift away from standalone physical venues toward digital inclusion networks, diverse ecosystems that connect existing community services and draw on trusted frontline relationships rather than building new

infrastructure (British Academy, 2024). They further draw on the knowledge already present in communities, treating digital inclusion as one part of wider social support rather than a standalone technical service.

Prior research on access is overly simplistic and technologically deterministic and thus fails to account for the nuanced socioeconomic and cultural conditions of marginalised populations (Parkinson & Lauzon, 2008). Indeed, the literature has consistently demonstrated that digital inclusion initiatives relying solely on techno-centric or skills-based interventions frequently fail to deliver expected outcomes or achieve transformative social change (Vannini et al., 2017). Yet, moving beyond access-driven models requires acknowledging that digital exclusion is not an isolated phenomenon, but rather a manifestation of structural, intersectional, and systemic inequalities (Zamani & Rousaki, 2024; Zamani & Vannini, 2025). It arises from a convergence of deprivations across different areas, such as education, health, and employment, further compounded by the intersections of race, class, and geography (Zamani & Vannini, 2022). To address these complexities, scholars have called for a feminist perspective and an ethics of care (Meng

et al., 2019; Zamani et al., 2026). This perspective shifts the focus from technology as a utilitarian tool to technology as a socio-technical system embedded in everyday acts of solidarity and care (Sweeney & Rhinesmith, 2017). A feminist lens reveals how merely increasing access through technological spaces does not automatically improve people's social conditions if power structures remain unchallenged (Nemer, 2016). An ethics of care prioritises people and community relationships over deliverables, viewing digital inclusion as an ongoing, participatory process of supporting the supporters rather than a one-time technical fix (Pires et al., 2025).

Furthermore, much of the failure of past digital inclusion efforts stems from their reliance on top-down, often off-the-shelf solutions, designed elsewhere and applied in broadly similar ways across different communities, frequently without sufficiently understanding the specific context of application (Heeks, 2002). A feminist ethics of care speaks directly to this failure mode, precisely because it insists that what counts as adequate support can only be determined relationally and situationally, through sustained attentiveness to the particular people and circumstances involved (Tronto, 1998), remaining in ongoing relationship and continuously revising what is needed as circumstances evolve. It is this relational, context-sensitive logic that we argue is missing from techno-centric responses to digital exclusion, and that we explore through our empirical case.

The necessity of this relational, care-driven approach has been drastically amplified in the wake of the COVID-19 pandemic, which shifted digital engagement from a convenience to an absolute necessity for survival. This era of 'digital-by-default' policies, where essential services like welfare and healthcare are moved online first and foremost, has reinforced exclusion for the most vulnerable (Zamani & Vannini, 2025), surfacing the urgent need for long-term, community-embedded capacity-building strategies to address digital inequalities (Southby et al., 2024).

Despite the growing reliance on digital inclusion networks as a potent response to this crisis, research exploring their internal mechanics remains notably limited. Existing scholarship has primarily documented the existence of these networks, focusing on the structural forms of collaboration between diverse stakeholders (e.g., D'Arcy et al., 2024; Wagg & Simeonova, 2021). However, there is a distinct scarcity of theoretical understanding regarding how these networks operationalise care to succeed where traditional techno-centric models have failed (e.g., Helsper & Reisdorf, 2016; Madon et al., 2009; Zamani & Rousaki, 2024). Because traditional models failed precisely by treating digital exclusion as a transactional, technical deficit rather than a relational deprivation,

we argue that novel responses to digital exclusion should entail fostering attentive, nurturing, and reciprocal relationships. This represents a critical gap in Information Systems (IS) literature: while we know these networks share knowledge and build local capacity, the underlying socio-technical mechanisms that transform them from mere administrative partnerships into engines of systemic social change remain under-theorised.

To address this, in this study we ask: *How do digital inclusion networks leverage relational, care-driven practices to transform responses to systemic digital inequalities?* We present findings from a paradigmatic case study based on over 3 years of sustained engagement with an exemplar digital inclusion network based in a rural county in the north of England. Our research offers a novel contribution by shifting the analytical focus from frameworks rooted in capitalistic and hierarchical structures to those that emphasise transformation through resisting these. Inspired by feminist perspectives (Barnes et al., 2015; Tsatsou, 2022; Vannini et al., 2024) and using the lens of Network Weaving (Holley, 2013) to IS research, we advocate for framing digital inclusion work explicitly as care work. We empirically demonstrate that networks built on attentive, nurturing, and reciprocal relationships have the potential to drive digital inclusion and drive social change within their communities by functioning as networks of care. Ultimately, our approach offers a people-centred alternative to the techno-centric responses to digital exclusion dominant in IS research and practice, demonstrating how they can be re-imagined to address the multi-dimensional nature of the phenomenon.

The remainder of this paper is structured as follows. Beginning with situating this research in the wider literature of digital inclusion, we proceed presenting the theoretical lens guiding this study. We then elaborate the relevance of Network Weaving for elucidating the underpinning principles of digital inclusion networks, arguing for the necessity for a NW approach in IS. Next, we provide a description of the methodology, including a description of our research context, and our data collection and analysis. We then present our findings and discuss these vis-a-vis the existing literature and in terms of the study's contributions. The paper concludes with offering reflections for stakeholders involved in digital inclusion decision-making and proposing directions for future research.

2. Theoretical background

Several studies to date have highlighted the implications of digital inequalities for digitally disadvantaged groups, whereby increasing digitalisation perpetuates and often exacerbates deep pre-existing socioeconomic disparities, while creating new ones (e.g.,

Alshallaqi & Al-Mamary, 2024; Larsson, 2021). These inequalities often emerge as reduced access to employment opportunities, education, healthcare, and civic participation. As a result, scholarship indicates that low-income households, older adults, people with disabilities and those living in remote/rural areas, to name a few, are all disproportionately affected by digital exclusion (Vassilakopoulou & Hustad, 2023). Therefore, combating digital exclusion has become essential not only to ensure equitable access for all to such opportunities, but also for reducing systemic inequalities.

2.1. From telecentres to digital inclusion networks

To date, there have been many research initiatives and funded projects for addressing digital exclusion, focused primarily on providing and facilitating wider access to the internet and ICTs. These have historically relied on the establishment of several public access venues (PAVs) (e.g., telecentres), designed around the premise that better access will result in capacity building and socio-economic development for the community. Research suggests, however, that PAVs are often characterised by failures, partly due to adopting techno-centric approaches while ignoring the needs on the ground (Heeks, 2002; Vannini, Rega, & Cantoni, 2015). Over the years, this has resulted in moving away from PAVs and toward digital inclusion networks (British Academy, 2024), which focus not merely on providing access but also on serving multiple needs and on harnessing community-embedded knowledge to address complex, overlapping deprivations.

While both PAVs and digital inclusion networks involve the aggregation of resources and efforts to combat digital exclusion, they differ significantly in their composition, operational focus, and underlying social logic. Telecentres are typically clusters of homogeneous physical venues specifically designed for public ICT access, sharing a common identity, branding, and management support system (Gomez, 2014; Latchem & Walker, 2003). Their primary driver is often institutional sustainability and economies of scale (Latchem & Walker, 2003). By organising into national or regional networks, individual centres can share central support units for lobbying, fundraising, and standardised service delivery. Ultimately, telecentre (as standalone or as networks) are built around physical ICT infrastructure, and their identity is rooted in the provision of technical services (Latchem & Walker, 2003).

Digital inclusion networks, instead, are heterogeneous ecosystems of varied organisations, including local government authorities, housing associations, schools, libraries, and voluntary, community, and social enterprise (VCSE) sector partners

(Suchowerska & McCosker, 2022). For many of these entities, digital inclusion is not their sole purpose, but rather one of many social activities they perform to support community well-being. Their operational focus is on connecting existing community services. Doing so, they move beyond a narrow focus on infrastructure to address the complex, multifaceted nature of digital poverty (Wagg et al., 2024). These networks prioritise trusted relationships, leveraging the contextual knowledge of frontline workers to reach excluded individuals (Southby et al., 2024) and facilitating a shift from a ‘deficit’ model to a strength-based approach that taps into the knowledge and relationships already existing within a community (Wagg et al., 2024). Consequently, digital inclusion networks function not as technical hubs, but as social infrastructures. They view digital inclusion as a socio-technical system and a tool for wider social inclusion, employing an asset-based strategy that taps into the knowledge and relationships already existing within community anchor institutions.

2.2. Digital inclusion and digital exclusion within the IS literature

The IS discipline has a long tradition in exploring digital exclusion. Very often, IS studies approach this phenomenon through the concept of the digital divide (Vassilakopoulou & Hustad, 2023), which serves as a foundational framework for understanding digital inequalities. The digital divide is a multidimensional phenomenon that operates across three levels (Wei et al., 2011). First-level divides focus on disparities in access, i.e., the access gap, whereby the focus is placed on infrastructure availability (e.g., broadband access in rural areas, device affordability among low-income households) (e.g., Fong, 2009; Onitsuka et al., 2018). The second-level refers to disparities in digital skills and the usage gap, and it thus considers digital literacy and aspects that relate to one’s self-efficacy and confidence in using technologies (e.g., Choudrie et al., 2021). Finally, the third-level focuses on the differential outcomes, i.e., the consequences of non-use in the form of missed opportunities, e.g., economic outcomes (Venkatesh & Sykes, 2013). Collectively, these three levels indicate that the digital divide is not a simple technological issue, but one that draws attention to “accessibility, literacy and skills, and adoption of digital technology” (Zheng & Walsham, 2021, p. 1), and which reflects and intertwines with broader societal inequalities.

Existing strategies to address digital exclusion are therefore naturally influenced by this three-level approach: enhancing infrastructure and access (e.g., social tariffs for low-income households (Faith, 2022)), digital skills training (e.g., Choudrie et al., 2021; Imran, 2023), and leveraging local resources,

including personal and peripheral networks, local champions and social connectors (Díaz Andrade & Urquhart, 2011; Renken & Heeks, 2019; Zhao et al., 2023), all aimed at bridging the gap between the “connected” and the “disconnected”.

Here we observe some shortcomings. Framing digital inclusion through the lens of digital divides produces a discourse that emphasises the ‘gap’ between those who can access and use digital technologies, and those who cannot (Vassilakopoulou & Hustad, 2023), where individuals are grouped along “the binary division of ‘haves’ and ‘have-nots’” (Zheng & Walsham, 2021, p. 1). We consider this problematic for two reasons. First, this framing has traditionally invited policy interventions that embody techno-solutionist and deficit-orientated perspectives (Zamani & Rousaki, 2024), which have resulted in high rates of failure of digital inclusion programmes (Helsper & Reisdorf, 2016; Madon et al., 2009), and often introduce additional barriers, particularly in contexts of deepening inequalities (Vannini et al., 2020). Second, this framing often misses the multidimensionality of digital inequalities and oversimplifies structural barriers (Zheng & Walsham, 2021). Digital inclusion extends beyond the adoption and use of technologies that enable participation and empowerment; it encompasses and requires the structural transformation of the powers that result in inequalities and exclusions in the first place (Pandey & Zheng, 2023). This then requires us to explore who or what can have this transformative power, or how this transformation may be possible. To understand what transformation might be and how it can be achieved, we turn our attention to Feminist scholarship and specifically ethics of care, a lens that, in our case, emerged inductively through data analysis but is presented here ahead of our Methods and Findings for clarity.

2.3. *Feminist perspectives and digital inequalities*

Feminist scholarship aims to understand and challenge oppression, inequalities, and dominant systems that sustain them. In doing so, the focus is on critiquing societal norms, but primarily in advocating and producing transformative changes that can facilitate equality and justice for all (Adam, 2002). Within the context of IS, feminist studies draw attention to how people interact with technologies, in terms of organising and enactment (Wilson, 2004), to making visible previously unseen forms of structural oppression and inequalities and challenging the structures that reinforce these (Vannini et al., 2024).

It would be wrong to assume that feminist scholarship is homogenous, i.e., that there is a single feminist theory. Rather, multiple theories exist that adopt diverse perspectives and critique inequalities from different vantage points, resulting in differences in

terms of what transformative change may look like and how it can be achieved. In terms of digital inclusion in particular, feminist approaches can become the critical lens required for understanding digital inclusion and exclusion by interrogating the structural, intersectional, and systemic factors that perpetuate inequalities in access to and use of digital technologies (Tsatsou, 2022). An ethics of care approach invites a reimagining of digital inclusion through the lens of empathy and compassion. By framing care as a collective responsibility (Tronto, 1987), rather than a gendered obligation (Fotaki et al., 2019), this perspective prioritises relationality, (inter)dependency, and situational context as drivers of transformational change (Koggel & Orme, 2010).

As such, care ethics allows us an alternative perspective for digital inclusion work. Digital exclusion is not a unidimensional issue, but the result of interconnected structural forces, where power dynamics embedded in the distribution of access and outcomes must be overturned through care work to address the root causes of inequalities. This, on the one hand, entails going beyond surface-level explanations of access to uncover the deeper socio-political structures that sustain digital inequalities. On the other hand, it requires acknowledging human interdependence, whereby the synergy of personal, political, individual, and collective efforts is required to achieve change (Hall, 2019) with a lasting impact. Guided by this emphasis on relational interdependence, research grounded in feminist and ethics of care perspectives frequently advocates for community-based organising (Balka, 1997; Floegel & Costello, 2022), and network-based work (Pettersen et al., 2024; e.g.; Wright et al., 2018) as essential mechanisms for fostering mutual support and collective mobilisation. We thus turn our attention to Network Weaving as a lens to examine digital inclusion.

2.4. *Network weaving’s perspective to examining networks*

In this study, we approach digital inclusion as an endeavour that can be best pursued through the perspective of Networking Weaving (NW) (Holley, 2013). Drawing on Holley’s (2013) conceptualisation, NW is defined as the intentional, community-centred practice of cultivating relationships to build a network capable of mutual support and collective action. In stark contrast to traditional, transactional networking, which tends to be self-serving, network weaving requires an acute awareness of relational dynamics, specifically focusing on identifying those who are excluded or whose voices are marginalised. By actively fostering new connections, bridging gaps between existing members, and deepening interpersonal trust, the practice of NW (or weaving networks) establishes

the foundational, fertile ground necessary for communities to co-create solutions and drive systemic social change.

We adopt NW as an approach to examining and exploring networks because NW places the emphasis on enabling and enacting “change through situated, transformational responses to systemic power structures” (Marais & Vannini, 2021, p. 46). As Holley (2013) notes, networks function as the foundational support structures of social systems, ensuring their stability. Therefore, understanding and acting upon the networks that maintain the status quo is essential to disrupting it. NW is a framework that offers a practical guide to inform and catalyse transformative systemic change by facilitating the establishment of new networks in society that actively challenge existing hierarchical power structures that reproduce and reinforce inequalities (Holley, 2013).

The origins of NW are traced back to the entrepreneurship space. Holley (2013) developed it as a way to support low-income entrepreneurs through the establishment of new networks that could bring change into their communities (Marais & Vannini, 2021). Building on this foundation, NW posits that facilitating transformational change requires deliberately nurturing grassroots networks, specifically focusing on people experiencing patterns of marginalisation. Holley (2013) proposes that NW drives this transformation by repositioning individuals within networks and fostering reciprocal relationships among peers. By acknowledging respective contributions and regarding each individual as a potential leader capable of forging connections, NW actively disperses and redistributes power. Emphasising the involvement of all stakeholders’ perspectives, NW demonstrates that while networks can take different forms and have different foci, their success in enabling change draws from four core principles: supportiveness, intentionality, action-orientated, and relationship-based (Holley, 2013; Krebs, 2005). Although NW does not formally employ the terminology of care, its core tenets align more closely with a care-based ethics than with the productivity-driven or profit-oriented frameworks typical of

institutional organising. A summary of the principles NW is based on is shown in Table 1.

NW offers an interdisciplinary perspective for examining networks which, to date, has been under-utilised in IS studies. We argue that introducing NW into IS research is both important and timely, as common IS epistemologies frequently overlook the deeply relational, power-laden, and affective dimensions of how socio-technical networks operate on the ground. By adopting NW, IS scholars are equipped with a vocabulary that enables researchers to investigate the *intentional human work* required to build, sustain, and leverage networks for social good. Specifically, in the context of addressing digital inequalities, NW provides IS research with a vital framework to study how digital inclusion can be achieved from the bottom-up. It reframes digital inclusion not merely as a technical deployment of infrastructure or skills training, but as a relational and political act of community empowerment. For example, in exploring these relational dynamics, Schlaile et al. (2021) explain that through network weaving, entrepreneurs can shift and strengthen their connections with others, in similar ways to bonding, bridging and linking with other stakeholder groups. Along these lines, Krebs (2005) explain that network weavers, as actors, and network weaving, as a practice, are crucial for building communities, collaborations and relationships that can create change and influence policy. Within the IS discipline, Marais and Vannini (2021) have applied NW specifically for examining IS projects within the international development sector, and show how enabling and weaving networks allows for building up capabilities and resources, and lobbying for transformational change through long-term and sustained partnerships.

As mentioned above, NW is not explicitly a feminist framework; however, its focus on building relationships and providing support reflects several aspects of caring and care work. We therefore posit that examining digital inclusion through the perspective of NW is compatible with feminist ethic of care (Barnes et al., 2015). A critical intersection between

Table 1. Summary of network weaving principles.

Network Weaving Principles	Description
Supportiveness	Being supportive in NW entails cultivating relationships and nurturing collaboration. The aim is to empower people, by acknowledging the intrinsic worth of every individual and their contributions across the network. At its core, it seeks to build a strong sense of community grounded in the values of care and mutual respect.
Intentionality	Networks need to have a purpose and shared vision. They can be formal and less formal, but whether they are effective depends on the commitment around the shared vision, and an alignment of values, purpose, and desired impact.
Action-orientated	Action means taking a dynamic, responsive approach to collaboration, and being able to identify and act on emerging opportunities. It encourages spontaneity and self-organisation. This is best served through less rigid structures that allow flexibility and adaptability.
Relationship-based	Relationships are understood as dynamic and far-reaching, extending to include individuals and organisations who may not yet be directly involved but who are recognised for their potential to contribute. Practices of reflection, mindfulness, and care are actively encouraged to sustain and deepen relationships. Relationship-building is not peripheral to the work, but integral to it.

these two frameworks lies in their treatment of power. In traditional, hierarchical settings, power can often get in the way of authentic care, reducing it to a transactional provision of access that maintains the status quo. In contrast, Holley (2013) emphasises that a focus on networks enables societal transformations precisely by rectifying these disparities in power dynamics. Because networks function as the foundational support structure of social systems, exposing and understanding them is essential to disrupting the status quo.

NW facilitates this by deliberately nurturing grassroots networks, focusing on communities experiencing marginalisation, encouraging a shift from hierarchical structures to peer-based, co-creative processes that move away from exerting control to creating a web of support that enhances relationships, sharing, resource access, and reflexivity (Holley, 2013). By regarding and supporting individuals as potential leaders of change and redistributing access to power through relationships, NW mirrors the feminist ethic of care.

This feminist ethic considers care as strength and care work as a deliberate mechanism to address power imbalances, placing the emphasis on the equitable distribution of resources rather than competition and accumulation (Barnes et al., 2015; Paudel & Soden, 2023). In other words, rather than requiring traditional power to provide care, genuine care within NW serves to *redistribute* power. NW allows us to consider how digital inclusion networks can achieve positive change on the grounds through caring for those who are digitally excluded and for the people and organisations working to help them.

For the purposes of our study, such an integrative approach allows us to analyse digital inclusion endeavours holistically. It ensures the focus remains on empowering people, communities, and grassroots organisations through dispersed, relational power, rather than merely addressing infrastructure and skills shortcomings through top-down interventions.

3. Methods

Digital inclusion policies very often fail in addressing digital inequalities (e.g., Díaz Andrade & Techatassanasoontorn, 2021), thus inviting a more careful analysis of the underlying reasons for such failures (Al-Muwil et al., 2019). In this study, and instead of querying into failures, we ask “How do digital inclusion networks (DIN) leverage relational, care-driven practices to transform responses to systemic digital inequalities?” to develop an understanding of the care work involved in digital inclusion networks. Therefore, we specifically designed our study around a paradigmatic case (Pavlich, 2010) of a DIN, which functions as an exemplar (Flyvbjerg,

2006) in terms of being able to reveal and explain the key elements and dimensions of a network that conducts precisely the care work we are interested in within its region. Although the primary data for this study was collected in 2023, our analysis is informed by over 3 years of longitudinal engagement with the DIN. Consequently, our analysis incorporates longitudinal insights that reflect a deep, contextual understanding stemming from this sustained involvement. In what follows, we describe in detail the particularities of this digital inclusion network.

3.1. Research context

Over the recent years, the United Kingdom (UK), like many other countries, has been focused on the digital transformation of government services, whereby the “digital by default” shift (Williams et al., 2016) is assumed to improve efficiencies. However, this has also resulted in a significantly reduced face-to-face service provision with disproportionate impacts on individuals experiencing exclusion and marginalisation across multiple, often intersecting, aspects of their lives (Zamani & Vannini, 2022). Current estimates indicate that about 1.6 million people in the UK are entirely offline, and that almost 17 million struggle to get online for a combination of reasons (GOV.UK, 2025).

To address issues of the digital divide, several networks and hubs have been set up, where these work to deliver digital inclusion support for local communities and organisations (Good Things Foundation, 2026). DIN¹ is one such network that was set up by a well-established charity organisation operating in a rural county in the North of England for over 100 years. The aim of the charity is broader than digital inclusion: it is to ensure that no-one is unfairly disadvantaged because of where they live, i.e., due to the rurality of the county. Activities the charity is involved with include domestic abuse awareness, food bank support, a community oil buying scheme, and a travel scheme, among others. As such, and over the years, the charity has built a good understanding of the diverse contextual conditions of the region, the needs of the local community and therefore the implications of inequalities, including due to digital exclusion.

The county contains many sparsely populated areas alongside some urban areas and has an increasingly aging population set to double by 2043. The county is also home to many rural businesses, farms and individuals working from home. Aware of the increasing dependence on the digital and the barriers faced by communities and businesses in the region, the charity made the strategic decision in 2022 to set up DIN to help reduce the implications of digital inequalities. Planned activities associated with this network included mapping digital inclusion offers across the

county; collaborating with community organisations and partners to develop digital inclusion pilot projects; support delivery of digital inclusion initiatives that improve the wellbeing of residents; increase the number of active digital champions in the county; and strengthen the digital resilience of the county's VCSE (Voluntary, Community and Social Enterprise) sector.

We purposefully chose to explore DIN as an exemplar case, specifically because of the number of activities it has developed, the organisations it has supported, and the diversity of the people and communities it reaches. Organisations involved in DIN are largely VCSE organisations and public services, as well as local champions operating in the rural county. For many of the organisations and champions belonging or engaged with the network, digital inclusion is one of the many activities they perform, undertaken in a paid, unpaid or voluntary capacity. The nature of the network and diversity of the organisations and champions enable it to reach individuals in need across the rural region and surrounding rural and semi-rural areas. Importantly, through its activities, DIN embodies what we are interested in in terms of care-driven practices to transform responses to systemic digital inequalities that creates equitable, and inclusive societies, and re-envisions them in ways that promote agency, and collective well-being (Barnes et al., 2015; Federici, 2018). In other words, this network was selected not because it lends itself to generalisability, but because it reveals key elements of the phenomenon under study.

3.2. Data collection

We conducted semi-structured interviews with participants, employing a combination of snowball and purposeful sampling. We recruited participants during DIN meetings, which we were attending, by advertising through DIN's mailing list that was set up by the main network convenors, and later, by referral, i.e., based on the recommendation of initial participants.

We conducted interviews with participants across multiple organisational levels (as described in Table 2), which provided the benefit of data triangulation through the comparison of views expressed by the participants across different levels. The aim here was not interview participants uniformly across the four levels, but rather to engage with as many different

voices as possible to ensure representation and diversity.

All in all, we interviewed 24 members and non-members of the DIN (Table 2). DIN members are quite diverse: they include Trusts, local authorities and other organisations and they are actively involved in the network. Those involved in the development of the network (e.g., responsible for identifying new partners) are primarily the DIN's trustees, and the charity's staff members, and we refer to them as Level 1. Level 2 refers to those who are more engaged with mapping activities (e.g., mapping digital poverty and access provision in the region), and are primarily individuals who work for the county's local authorities, or volunteers. In turn, Level 3 represents individuals from organisations who have joined DIN, primarily for tapping into the network's expertise and for receiving support (e.g., libraries, housing associations); we note, however, that several of them oscillate between Level 3 and Level 2, because Level 3 members often share insights with regards to digital inclusion activities taking place within the county. Finally, we also interviewed non-members and these are indicated as Level 4. Non-members correspond to individuals and organisations who do not directly nor actively engage in the delivery of DIN's activities, but they often collaborate with DIN for knowledge exchange and expertise sharing, e.g., members of external digital hubs and networks active in different parts of the country.

Interviews were conducted online or in-person depending on availability and preference. Each interview lasted between 20 minutes to 90 min, where the overall average is 55 min long. All interviews were audio recorded and then manually transcribed. Our line of inquiry focused on the drivers and challenges of developing a digital inclusion network; the motivations for joining such a network (i.e., the benefits of participating in the network); as well as details on activities and impact experienced across the county. In other words, we focused on exploring the benefits for DIN members (e.g., resource sharing, experience sharing, knowledge exchange) and for individuals and communities (i.e., alleviation of digital inequalities), as well as the activities and work that enable these.

These semi-structured interviews were also complemented by observations and archival material.

Table 2. Overview of interviewees.

Level	Description	N of interviewees
Level 1 (L1)	Key stakeholders responsible for managing the network's development	2
Level 2 (L2)	Key stakeholders involved in mapping digital poverty and digital inclusion activities for the network	2
Level 3 (L3)	Individuals from organisations that have joined the network	15
Level 4 (L4)	Individuals from organisations that have been involved in digital inclusion networks and mapping digital poverty/inclusion activities in other locations in the UK	5

Specifically, we conducted five non-intrusive observations (four in-person, one online), where we did not participate or interfere with the activities or participants. These observations were motivated by the explicit intention to build on the rich data gathered through the interviews, to expand our understanding of some of the organisations within the network and explore the relationships and dynamics between the various DIN members. To organise our observations and maximise their value, we developed an observation protocol (Stausberg, 2012) for our fieldnotes-keeping, covering criteria that considered the local infrastructure of the rural location, the layout and atmosphere of DIN's meeting space, descriptions of the activities undertaken, details of digital inclusion initiatives, and the roles of volunteers or workers involved. These observations were between 1–2 hrs, and after each observation we prepared hand-written memos containing our reflections. While the activities we observed varied (e.g., digital inclusion training sessions, steering group meetings), our aim across all of these was to capture the overall approach taken by the organisations in terms of their operation and priorities around digital inclusion. In terms of archival material, this corresponds to the network's online resources, which included: monthly meeting agendas and minutes, meeting recordings where available, website material on digital inclusion-related schemes, online resources for local digital champions, and newsletters.

3.3. Data analysis

For our data analysis, we adopted a two-tier approach, where analysis and interpretation of findings were organised in two levels. All three authors engaged during the process by coding data collaboratively via Dedoose.

Our analysis was conducted in two steps: First, we followed a deductive approach, by focusing on the NW principles and purposefully interrogating our data for evidence of NW, i.e., the principles of intentionality, and relationships-, support-, and action-orientation (Holley, 2013; Krebs, 2005). At this stage, we used a predefined codebook, whereby we were interested in detecting practices and processes adopted by DIN. As such, our initial codes at this stage were directly derived from the NW principles, where we mapped explicitly these principles onto our material. This helped us to move from a more generic and abstract understanding of NW to a more precise consideration of which practices and processes do contribute toward building and maintaining a successful network.

During the second tier to our analysis our aim here was to examine why (rather than how) NW allows DIN to transform responses to systemic digital

inequalities. It was during this move, from the first to the second tier of analysis, where we began seeing that the NW principles allow DIN to function as a 'caring organisation' while working toward addressing digital inequalities and achieving transformational change. To be more precise, our analysis suggests that the NW principles represent to various degrees the care ethic phases of caring about, caring for, caregiving and care receiving (Fisher & Tronto, 2003; Tronto, 1998), where DIN engages in the care work required for combatting digital inequalities. As an example, during this stage, we noticed that being supportive and intentional (NW principles) have been allowing DIN to identify real rather than perceived needs for digital inclusion, which is an expression of 'caring about'. Therefore, at this stage we proceeded by mapping our material against the care ethics principles.

Table A1 (see Appendix) provides a detailed overview of our analysis process. We note that while the data analysis process appears in this table as linear and sequential, there were several iterations across stages and within stages (e.g., while in Stage 4, we frequently had to revisit Stages 2 and 3 to reconcile discrepancies and gaps in understanding). Table 3 presents the results of coding, where we map the NW principles across the care ethic phases, as emerging through our empirical material. In the next section, we discuss these in detail.

4. Findings: achieving transformational change as a caring organisation

DIN has been transforming responses to systemic digital inequalities across the county, evidenced through numerous ways. By leveraging its partnerships and relationships with organisations across the county and nationally, DIN has managed to secure substantial funding across two funding rounds. This funding has been used for commissioning the mapping of digital inclusion offers across the county and the residents' survey (cf., Section 3.1) and for delivering 12 digital inclusion projects, each designed specifically around the gaps in provision identified via mapping and surveying. In addition, this funding also enabled DIN to provide cascade funding for 22 more projects, delivered by other organisations (specifically VCSE organisations and social enterprise groups) for new and existing services and activities that could meet the DIN's objectives and priorities (e.g., developing resources, delivering training, covering areas with poor or no digital offerings). Directly or via its members, DIN has successfully supported numerous individuals by helping them build up their confidence in using technology during online and onsite workshops, one-to-one sessions, and more.

Table 3. Codebook.

Care Ethic Phases	NW Principles	Description	Examples
Caring about: “becoming aware of and paying attention to the need for caring” (Tronto, 1998, p. 16)	Intentional	Being intentional entails pursuing objectives that align with the overall mission of the network as well as with the identified needs, where projects and other initiatives are specifically designed for addressing the digital inclusion barriers (e.g., connectivity, lack of devices) and the evolving needs on the grounds.	<i>[from the website] DIN is committed to reducing digital inequalities due to the rurality of the county. DIN recognises the value of going online and works to ensure that everyone, irrespective of location, has the opportunity to do so. . . . the importance of listening to people and what their needs are with their organisation and gaining an understanding of what it is that they do and not making assumptions about it. So, a network is no good if it's not relevant to people (L1)</i>
	Supportive	Being supportive entails being attentive to what are the needs for digital inclusion and what are the barriers that result in digital exclusion and inequalities. DIN identifies said needs and barriers via their mapping exercise and the residents survey (both being frequently updated), and by engaging with community organisations (who may or may not be DIN members, such as libraries, churches, and charities, and who have a more accurate understanding of the diverse needs of the people they serve).	<i>The mapping really was to understand what was happening with respect to supporting digital inclusion across the county so we could start understanding who was working out there across the county, and that would form our network. And that has enabled me improving my knowledge and I was getting this network together and sharing information. (L2) So, we always want to listen and encourage people to feed back. So, things like the health app presentation, we knew that would be relevant to people and might hopefully inspire some people. And there are common themes. I think that a lot of it possibly could stem from the barriers for the people that are accessing the services and the ways to get over that. (L1)</i>
	Supportive	DIN recognises that what is needed is taking responsibility for bridging gaps. A large part of how DIN takes responsibility for such support is by securing funding (via donations, competitive schemes and via central government) that is then used for small pot funding around skills training, connectivity, device and data. This support may also take the form of helping other secure funding themselves directly and/or pairing up with other digital initiatives and projects to share resources.	<i>We identified the need for having an individual who was responsible, and we did say we couldn't afford to fund it in the early years. So, we just approached the Local Council, sold them the concept, and they were very good at picking that up and deciding, “Yeah, this sounds like a worthwhile cause to finance”. (L2) Opportunities going forward, to organise some open houses in a way for some digital projects come and see what they're doing, so that might be other digital projects to come and see, but it might also be other stakeholders. It might be from the local authority or from the local business partnership . . . Could they provide funding for similar projects. Could we facilitate that kind of thing. (L1)</i>
Caring for: “someone has to assume the responsibility for organizing, marshalling resources or personnel, and paying for the care work that will meet the identified needs” (Tronto, 1998, p. 17)	Relationship-based	Taking responsibility for combatting digital exclusion for DIN further entails empowering others (e.g., charities, council departments, community groups) to deliver digital initiatives themselves and nurturing those collaborations that can cross fertilise ideas, insights and outcomes.	<i>So rather than having staff from a national charity kind of parachute into a community to provide a one-off intervention, it's more about empowering and supporting community organisations to be able to provide the support themselves, because often support is needed to be person-centred, very much designed for an individual. (L3) All I am doing is joining the dots, but I think joining the dots is as important as being part of a service. (L3)</i>

(Continued)

Table 3. (Continued).

Care Ethic Phases	NW Principles	Description	Examples
Caregiving: “perform[ing] the necessary caring tasks [and it] involves knowledge about how to care” (Tronto, 1998, p. 17)	Action-orientated	Being action-orientated is about DIN providing the care and support needed for combatting digital inequalities, and the do this by a) addressing very practical needs (e.g., lack of connectivity) and b) spontaneously and flexibly responding to opportunities for collaboration and joining up efforts with others who may not be DIN members. What makes these actions successful however, is the fact that DIN and the people involved in it have a good understanding of the gaps and real needs, and this has been made possible through early work on mapping, surveying and engaging with local communities.	<i>[from the website]: Small grants scheme (up to £50K): funding priorities include training digital champions, helping people develop digital skills for specific contexts (e.g., NHS mobile app), cover areas without connectivity and so on; Voucher scheme: funding to improve broadband connectivity across the hard-to-reach rural areas (up to £4,5K each), topped up by the county council (extra £3K); Free wi-fi boxes via partnerships, data SIM cards, device referral and donation scheme (refurbished devices). I work with an organisation that supports refugees across a neighbouring county. They have people who are looking for some form of digital skills training. Through another contact on the network, I was able to identify an organisation that would provide them the training, and with another organisation's help, able to then find a venue for the training to take place. So, it's all about sort of connecting organisations together. (L4)</i>
Care receiving: “the response of the [entity] that received the caregiving” (Tronto, 1998, p. 17)	Relationship-based	DIN is engaged in providing support with digital inclusion initiatives and projects. At the same time, it is comprised of member organisations that have received such support themselves through DIN and other entities, and they exhibit reciprocity whereby they share their experiences and insights, and tangible support with others still working toward digital inclusion.	<i>And people can advise each other on the best way that they've found to recruit volunteers or . . . Something that we've had fed back is that people have found the sessions [with reference to drop-in sessions] are more likely to be attended if they're put across as being quite informal, not like teachy, teachy. (L4) I used to work on the ABC Project [supported by DIN], and you start seeing the value of a network. So, personally from my point of view actually joining together these projects in a network made perfect sense from the benefits . . . the benefits of a person who works as a facilitator of a network where you start to see how the sharing of information and getting that sense of the bigger picture is really, really valuable. (L4)</i>

In terms of partnerships, DIN engages with a wide range of organisations, without restrictions, as long as there is alignment between their missions:

And then of course there are a number of other churches, foodbanks that keep in touch with us as well, different art projects across the county community hub that like to hear what we're up to. Community banks, advice services, housing associations and providers. The Police also keep on our mailing list, and they come and support us with information about online safety. DWP, P3 Charity as well, and the Business Partnership, and then also we have a number of people, independent people who just completed the survey as well who are interested in hearing about digital. [...] So, whether they're running projects, or they have an interest in digital because it's part of their workstream. . . (L1)

One example is that with the National Health System (NHS) Digital Healthcare Services, whereby DIN has worked toward identifying and supporting the delivery of digital inclusion initiatives by providing insights and expertise in relation to the uptake and adoption of

the NHS app that enables access to healthcare and aims to encourage digital health literacy (NHS England [NHS], 2024). Another partnership is with a national charity that specialises in device refurbishments, seeking to increase the availability of digital devices among digital excluded individuals, and community groups. In addition, the network has lobbied the county's council to launch a voucher scheme for broadband connections for those who cannot afford it and collaborates with other charities and telecommunication providers to provide free internet access for households and community places that cannot afford connectivity. The above achievements are of particular significance, especially because they have been made possible post-pandemic and during a period of increasing cost of living crisis.

Our analysis indicates that these changes were made possible precisely because the network embodies NW and ethics of care principles, which in turn transform DIN into a caring organisation. A caring organisation is one that “develop[s] a community of

mutual purpose” and which “places people at the centre” by moving away from transactional models and into a space where relationships and relational capabilities can flourish (Xu & Smyth, 2023, p. 2). DIN operates with intentionality and purpose that is centred and driven by their vision to support everyone in the county, on the basis of community-building and nurturing relationships, all crucial characteristics of caring organisations (Bendl et al., 2019). As presented in our findings, DIN operates by fostering peer-to-peer networking and collaborations rather than traditional top-down interventions. By valuing and prioritising relational work, DIN invites a reimagining of digital inclusion initiatives, advocating that such efforts must not be detached from people’s lived experiences, but fundamentally entrenched within the grassroots care work already supporting communities exposed to structural and digital inequalities:

So, really embedding the digital inclusion support into organisations in all sorts of different aspects. [...] There’s so much potential [...] where an organisation works with learners to help them with digital skills to get them started. But then they also run online support groups so that once people [...] have their initial digital skills, they also have a reason to keep using it. They can attend the weekly support group. That helps them with social engagement and then that keeps them in touch with the organisation. (L2)

It is through such nurturing practices and relationships that DIN becomes empowered and empowers its members and citizens (i.e., caring within and outside the organisation) (Lawrence & Maitlis, 2012) and succeeds in collectively addressing digital inequalities and creating sustainable impact across their communities:

It is that knock-on effect that is so inspiring, not just for me but for the people who have done it. And I think the news that I had last week from Community Charity that they had helped 405 individual people to understand computers—that is a fantastic achievement. (L3)

In what follows, we present our analysis in detail, tracing the four care ethics phases previously discussed. We show that DIN, guided by NW principles, operationalises each of these phases through a distinct mechanism: rather than functioning as a fixed or linear sequence, these mechanisms interlock and mutually reinforce one another, with each subsection below illustrating both the mechanism itself and how it depends on, and feeds into, the others. We return to the relationship between these mechanisms, and present it visually, at the opening of our Discussion.

4.1. *Caring about*

Caring about, the phase through which an unmet need is first recognised (Tronto, 1998), is operationalised by DIN through a mechanism of conscious attentiveness to the needs of diverse stakeholders. As a foundational element of care work, it concerns recognising that an unmet need exists. In the context of digital exclusion, this means acknowledging structural disparities in access, literacies and infrastructure. Crucially, it requires cultivating an attentive awareness of member organisations support needs, identifying their real, rather than perceived, barriers through a grounded, bottom-up approach.

Immediately upon its establishment, one of DIN’s foundational activities was commissioning a county-wide digital exclusion risk map. This mapping exercise utilised the Digital Exclusion Risk Index (DERI), a tool developed by the Greater Manchester Combined Authority (GMCA, 2021) that accounts for connectivity, deprivation and demography. This mapping activity is illustrated as a colour coded layer superimposed on a geographical map (Figure 1, right), with red denoting higher digital exclusion risk and blue denoting a lower risk. Following this, DIN mapped out digital inclusion offers and initiatives across the county (Figure 1, left).

This activity was further informed through a telephone survey with county residents on their internet use, and another one forwarded to the county’s voluntary, community and social enterprise (VCSE) organisations across the county, asking them their location, the type of support offered and who they supported; the barriers individuals face when accessing online services; and resources required to continue their digital inclusion offer. Figure 1 provides an example of a response, whereby interested individuals can click on any of the circles to access information with regards to what is available in terms of digital inclusion offer and support by the chosen organisation.

As shown through the comparison of the two pictures in Figure 1, this mapping that the south of the county was an area requiring more digital support (greater concentration of red-coded). Combined with the survey results, it further highlighted the specific issues faced by organisations within that part of the county in terms of delivering digital inclusion support, and which activities and areas should be prioritised.

This map is continuously updated using data provided by DIN members and network beneficiaries. It serves as a foundational tool for DIN’s operations, enabling the network to identify gaps in provision, and the specific, situated needs of those experiencing digital exclusion. Consequently,

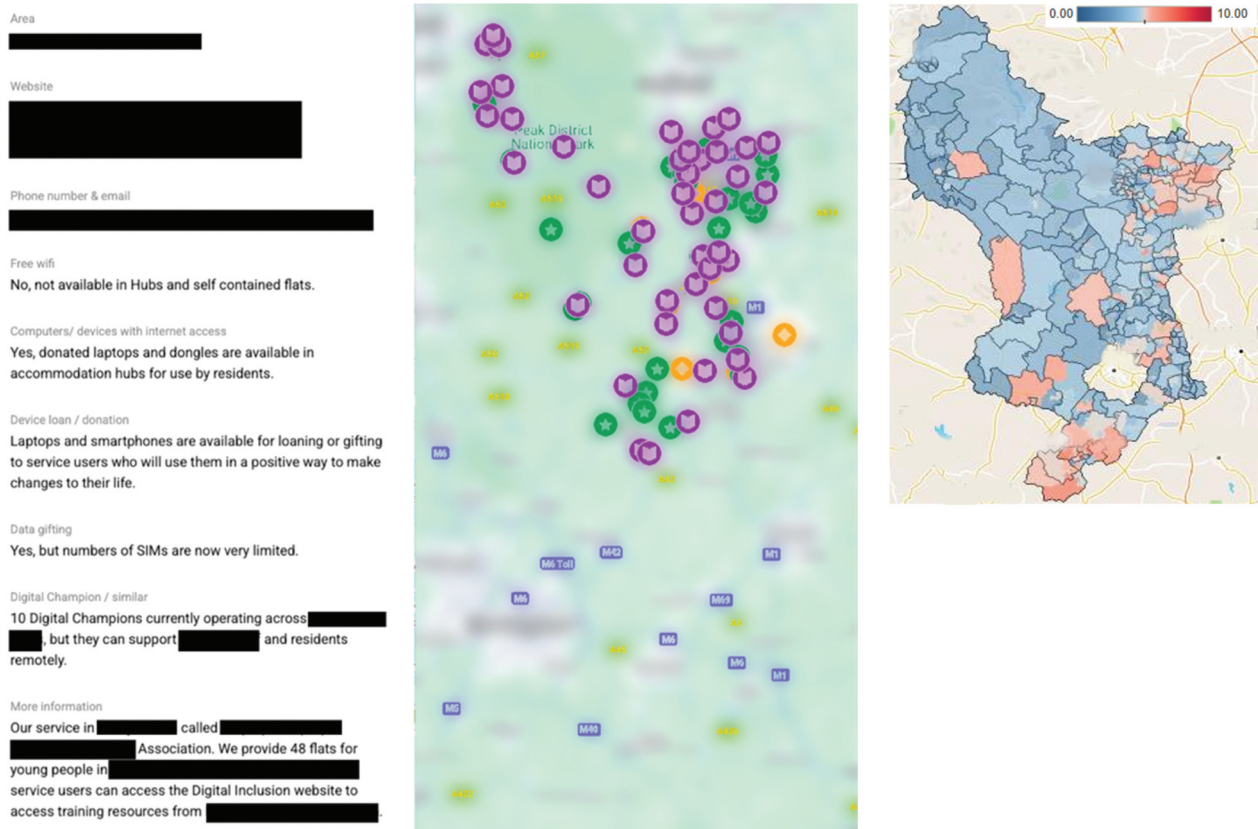


Figure 1. DIN's mapping of digital exclusion risk and digital inclusion offers and initiatives (all areas and providers have been anonymised for confidentiality purposes).

this dynamic mapping directly informs their priorities and actions for mitigating digital inequalities (cf., caregiving):

The mapping really was to understand what was happening with respect to supporting digital inclusion across the county so we could start understanding who was working out there across the county, and that would form our network. And that has enabled me improving my knowledge and I was getting this network together and sharing information. (L2)

This ensures that DIN's conception of care is informed by lived realities rather than assumptions, explicitly acknowledging the heterogeneous nature of digital exclusion across the county's diverse geographies, demographics and abilities.

These practices are further informed by engaging with a wide range of local organisations and business (e.g., council departments, charities, churches and NGOs), who very often have a more nuanced understanding of what is truly needed:

... the importance of listening to people and what their needs are with their organisation and gaining an understanding of what it is that they do and not making assumptions about it. (L1)

The very same practice of engaging with local organisations to form a hyperlocal network is driven by the awareness that these actors hold the deepest

knowledge of—and trust within—their communities. This practice is driven by the understanding that genuine care cannot be 'parachuted' in. Because they are already embedded on the ground, these organisations are uniquely equipped to provide long-term, person-centred support:

... support is best provided by trusted organisations in local communities, because people who are digitally excluded often lack confidence to access more formal digital skills support. And often, they need support at a time of crisis, more and more so now, as more and more services are online. [...] and that's an opportunity [...] to be able to then build a relationship and help that person develop their digital skills and confidence. So, it fundamentally came from knowledge that those organisations are best placed to provide support. [...] And over the long term, because people on their journey will maybe get a bit of support, and then they might drop out for a bit, and then they might come back and need a bit more support. (L3)

Engaging with others, however, necessitates shared values and objectives (intentionality), irrespective of what the primary function of the collaborating organisation is. For example, DIN has been engaging with the county's Food Bank, as there was a mutual interest in increasing digital engagement with their projects:

But then also organising these very specific workshops so like I was saying about organising something for the Food Project going forward so that they can have a Q&A session with specific [DIN] project leads, on how to set up devices and what support they might want to give to people visiting their projects, and how they might start. (L2)

This bottom-up approach reflects a deeply supportive practice, whereby individuals and organisations come together to collaboratively identify priority needs. This creates the fertile ground for participants to cultivate relationships, build community capacity, and feel empowered and valued (supportiveness). This supportiveness is further evidenced by how DIN actively lays the groundwork to ensure all member organisations and individuals are treated as equal partners:

We need to hear from organisations who are working in communities, about the reality of providing support. We need to know what they're seeing, what they're hearing, so that can inform what we do as a national charity. And so, I think it's really important for organisations to feel like they're an equal partner in a network, that they're valued, otherwise you won't engage because you want to feel like you're getting value from being involved. And I mean, I've personally seen this in the community sector, where I've been part of networks and haven't felt like an equal partner round the table, and particularly with public sector partners. (L2)

... as well as in the way the DIN is continuously listening to its members' needs in order to provide the right support for them:

So my role, and my team, are all about making sure that is happening, and that we are also responsive to the needs of members of the network. So we are listening to what their challenges are all the time, and particularly through our events and training, thinking about how we might be able to support them with those issues. (L2)

4.2. *Caring for*

Caring for is the phase in which intention and active responsibility are assumed for meeting an identified need (Tronto, 1998). DIN operationalises this phase through a mechanism of organising and resourcing care, that is, of ensuring others have what they need to meet identified needs themselves. Distinct from caregiving (the hands-on delivery of support, discussed below), this mechanism centres on equipping other organisations and individuals with the resources, funding and training to become 'caregivers' in their own right. Specifically, this dimension of care is evident in DIN's efforts to secure funding—sourced from donations, central government, and competitive schemes—and distribute it directly to its member organisations. By financing essential provisions like

digital skills training, devices, and data access, DIN directly alleviates the financial barriers that often hinder these local actors from effectively addressing digital inequalities:

I think particularly with the small groups that are out in the community, because they might not have that experience and it's a very daunting thing trying to think about applying for funding. It's something that's very much ... It's constantly mentioned, I think. It's one of the biggest barriers for their sustainability, I would say, judging from what we've got back from the surveys, is the funding element of it. (L2)

Because DIN functions essentially as a facilitator, even in cases when the network is unable to directly fund these smaller groups, they liaise with other organisations (e.g., the council) to lobby them for funding the digital inclusion needs of their members:

We identified the need for having an individual who was responsible, and we did say we couldn't afford to fund it in the early years. So, we just approached the Local Council, sold them the concept, and they were very good at picking that up and deciding, "Yeah, this sounds like a worthwhile cause to finance". (L2)

Another side of this responsibility for "caring for" can be seen via the relationship-building approach adopted by DIN, whereby they bring people and organisations together who can help others through sharing resources and insights, designing collaborative projects, and learning from each other:

So rather than having staff from a national charity kind of parachute into a community to provide a one-off intervention, it's more about empowering and supporting community organisations to be able to provide the support themselves, because often support is needed to be person-centred, very much designed for an individual. (L3)

To deliver on the above, DIN organises various support and training sessions for its members, carefully tailoring the format and delivery methods to best suit how these diverse organisations learn and engage. Notably, the network prioritises the social and affective dimensions of care within its support structures, as the following quote demonstrates:

Something that we've had feedback on is that people have found the [online] sessions are more likely to be attended if they're put across as being quite informal, not like teachy, teachy. And almost it's the social aspect that's emphasised. And we've been able to advise another project, who has set up sessions but isn't having the footfall that they wanted, that this is what other projects have found, that if you play it down almost but emphasise the social side and make it sound quite informal, people are more likely to come to you. So it's shared experiences, I guess, a lot of the time. (L1)

Co-production is also prioritised, further highlighting the strong focus of the network on efforts that are relationships-based and bottom-up:

Because, actually, the first thing we've got to do is respond to what carers are telling us, which is that a computer-heavy model may not be the most appropriate [...] way forward at this moment in time. But also then ensuring that we had that opportunity to feed back and make sure that we were taking carers with us on this project, that it was still, as far as possible, a co-production model. (L3)

This has a dual benefit: on the one hand, these organisations become empowered to address the digital exclusions experienced by their beneficiaries (e.g., unpaid carers) via receiving training and support in how they themselves can deliver such activities; on the other hand, this also means that participants (i.e., beneficiaries) engage with trusted partners, and are able to contextualise the support and information received within their own circumstances:

... with the home library services or care workers, so people who go to the homes of people who might not be able to leave the house in different ways, like mobility issues or caring responsibilities or whatever it is. [...] if it's your care worker who helps you order online prescriptions, then if they could take the extra 5, 10 minutes to show you, you can also search for dancing online or whatever your interest is. (L3)

In other words, more than merely coordinating and providing resources, DIN's operational model is underpinned by their commitment in capacity-building and empowering members and non-members, whereby caring for entails functioning as a supporter and enabler of care, and where the network is focused on creating the conditions for developing nurturing and caring relationships (relationship-based):

And my role is about strengthening that network, engaging with that network, providing them with tools and resources so that they [emphasis added] can provide the support, and make the most of the products and services that the network offers. (L4)

Therefore, for DIN, taking responsibility for "caring for" entails moving away from isolated interventions and dependencies, and closer to a relational infrastructure that values empowerment and collective efforts.

4.3. Caregiving

Caregiving is the phase in which care moves into direct, tangible action (Tronto, 1998). DIN operationalises this phase through a mechanism of hands-on provision, translating the resourcing and capacity-building achieved through caring for into practical interventions that directly close gaps in digital provision. Crucially, these hands-on efforts are grounded in the deep, local knowledge the network has

systematically cultivated through mapping, surveying, and community engagement.

As previously discussed, this tangible support includes the provision of cascade funding for different projects. To date, DIN has funded 22 digital inclusion initiatives across the county through its small grant scheme (i.e., £2,000-£5,000). These grants have enabled grassroots organisations to deliver targeted training (such as women only or one-to-one sessions,) conduct home visits in isolated rural areas, and upskill their front-line staff. In addition, DIN coordinates an extensive distribution network for refurbished devices, Wi-Fi hotspots, and data. This infrastructure is sustained through collaborative partnerships with network members, local businesses, and universities, who source and donate these essential resources. The following quote highlights how fostering relationships within the network is essential for translating these support mechanisms into practical reality:

One of the groups that I work with is a local volunteer group that helps the refugees in the area and there is also a group that does the Care for Calais stuff, as well. And then you have got digital distribution scheme who distribute devices but neither group was aware of the other. And so, getting those connections I was able to act as a bit of a middle person in there, and say well actually I can help you with a couple of these, we can get some laptops, we can get some devices. (L4)

This service is directed to DIN members, but also individuals within the county who may be eligible, and whose needs are often identified through the organisations and charities that support them:

I was a volunteer, like a digital buddy, mainly with ABC service; being a digital buddy for a gentleman called [...] who was actually in one of our properties [housing association] and received the support from us but had been referred to them for a device and, you know, as part of the support, as part of their project. (L3)

Within DIN, however, caregiving is inherently adaptive. For example, the network developed the Digital Pantries initiative, which integrates basic digital training and support directly into community food bank settings. This model of situated care—providing pop-up support in trusted, everyday locations—assists county residents with troubleshooting and onboarding to digital essential services applications, like the NHS app. Crucially, it operationalises care by meeting individuals where they are: accommodating their current level of digital maturity, operating within the physical spaces they already frequent, and responding at the exact moment they require assistance. Further, DIN's adaptive and flexible approach to caregiving enables the network to capitalise on emerging opportunities, particularly when partners share the common goal of addressing digital inequalities:

Well, we were approached to support it off the back of all the work that we'd done around digital in North County. So, the NHS Integrated Care Board covers the whole of the county, pretty much, with the exception of South and West County. And they were looking for someone who had some digital experience and the geographical knowledge of North County. (L4)

The excerpt above describes an instance where the National Health Service (NHS) approached DIN for insights to improve digital inclusion and, through it, their engagement in the northern part of the county. Although the healthcare and social care system lie outside DIN's primary purview, the network identified a critical intersection in their respective missions: mitigating the impact of digital inequalities on community wellbeing. DIN's action-orientated commitment to caregiving fostered the flexibility needed to seize this collaborative opportunity and expand its reach. Ultimately, these guiding principles have catalysed numerous opportunities and bottom-up initiatives, prompting a gradual, yet profound shift in perspectives regarding who bears responsibility for digital inclusion, and how digital inclusion initiatives should be designed:

Not just groups that are delivering digital projects but groups that have a digital interface with their service users, be they the Carers Organisation or other voluntary organisations, so that they can start to think about the digital needs of their staff. Of their volunteers. Of the platforms that they're using. And how they're supporting their staff and their volunteers, but also the clients that are using their digital tools, so that we can then find ways to use the network, hopefully, so that those that are more digitally mature could perhaps support other organisations [...] to think about what they could do to make those interfaces more user friendly. To ensure that their staff know how to get the most out of them and access them. (L1)

But this action-oriented caregiving translates, within member organisations, beyond the design of digital inclusion initiatives and extends to the design of the services and spaces that will enable change and transformation within the community they serve. Numerous organisations show this care through creating welcoming spaces for the community to meet, feel welcome, and socialise, often alongside other community activities such as health and wellbeing sessions:

The room: Through doors off the Recreation Building entrance, you enter a large room with floor to ceiling windows on one wall with views of hills and the playing fields; the French doors open out onto a large patio. There is a welcome table with informational leaflets e.g. Local Police and a raffle. There are 12 tables and a bar on the back wall. (Observation, L3)

... and socialise in different ways:

Wednesday, that's another fairly full day because we've got more health and wellbeing sessions and Tai Chi. And then Thursday, Digital Cafe, which is

a community helpline for anyone who has computer or mobile phone problems. (L3)

4.4. Care-receiving

Care-receiving is the phase concerned with evaluating "how well the care provided had met the caring need" (Tronto, 2010, p. 160). DIN operationalises this phase through a mechanism of reciprocal re-entry: rather than a passive endpoint, care-receiving is how beneficiaries evaluate the support they receive and, in doing so, take on the role of caregivers themselves, regenerating the attentiveness to need that characterises caring about and feeding back into the network's other mechanisms.

Our findings here provide another way of considering care-receiving, precisely because of its networked and reciprocal nature, thus making DIN quite distinctive in what care receiving means. Many DIN members are not only delivering digital inclusion initiatives (such as the informal check-ins, drop-in sessions and workshops discussed earlier), but they themselves have been recipients of care, through funding, shared resources and knowledge exchange sessions provided by DIN and its more digitally mature members.

As one tangible example of this, previous and current project leads (who earlier benefited from DIN) make themselves available for workshops and informal Q&A sessions to share their own expertise with prospective project leads and share advice with them:

[with reference to Q&A sessions] And people can advise each other on the best way that they've found to recruit volunteers or ... Something that we've had fed back is that people have found the sessions [with reference to drop-in sessions] are more likely to be attended if they're put across as being quite informal, not like teachy, teachy. (L4)

This means that DIN members do not remain firmly positioned within the network exclusively as care recipients, but step into being caregivers themselves, contributing back through sharing lessons learned and offering tangible support when able. Care-receiving, in this sense, is a relationship-based process in which care is co-produced through ongoing feedback, reflection, and mutual support.

5. Discussion: caring networks for transformational change

5.1. DIN as a caring network: a cyclical model of care mechanisms

The pace of digitalisation of public services has fundamentally reconfigured the way people access services and support, and the way they interact with each other (Lindgren et al., 2019). It has also inadvertently exacerbated existing digital inequalities, and resulted in

new ones, whereby digital-first approaches have had compounding disadvantages that extend beyond mere digital exclusion to encompass reduced access to essential services, information, and opportunities (Zamani & Rousaki, 2024). Within this context, digital inclusion networks have emerged as critical actors, playing a pivotal role in mitigating the adverse effects of digitalisation by creating a different ecosystem for digital inclusion and treating it as part of the wider social support needed in the community. This study has offered a framework for theoretically understanding how these networks operationalise care ethics and care-driven practices to transform responses to systemic digital inequalities. Such an approach offers essential contributions to IS research as mainly technical or techno-centric solutions have consistently proven insufficient to address deeply rooted digital inequalities across diverse communities (Marais & Vannini, 2021; Zamani & Rousaki, 2024; Zamani & Vannini, 2022).

Our analysis of a paradigmatic case study of a successful DIN based in rural UK shows how, embodying the principles of Network Weaving (NW) (Holley, 2013), the network fosters supportive, nurturing relationships with a wide range of stakeholders. Through this relational approach, DIN not only strengthens its network but also remains actively engaged in the practical work required to support its county in becoming more digitally inclusive. DIN treats digital exclusion as a relational deprivation that requires care work, shifting away from what Xu and Smyth (2023) describe as frameworks that prioritise top-down structures and transactional relations. In other words, DIN operates as a network of care fostered by NW principles and feminist ethics.

Operating as a caring network has allowed DIN to reconceptualise digital inclusion as horizontally integrated across services and organisations, rather than as siloed initiatives. In doing so, their model of operations reflects deeply the care ethics phases and the mechanisms through which DIN enacts them: identifying needs through a mechanism of conscious attentiveness (caring about), organising and resourcing support through a mechanism of equipping others to act (caring for), and providing the infrastructure for bringing everyone together to share insights into 'what works and what doesn't' through mechanisms of hands-on delivery and reciprocal re-entry (caregiving, care-receiving), where collectively they all engage in the work that helps 'repair' (Fisher & Tronto, 2003) their county and keep it going despite the implications of fast-paced digitalisation.

Figure 2 visualises this interlocking process, with the four central ovals representing the mechanisms through which DIN, guided by network weaving principles, operationalises Tronto's (1998) four care ethic

phases: caring about, caring for, caregiving, and care-receiving. The bidirectional arrows indicate that these mechanisms interlock and mutually reinforce one another, rather than proceeding in a fixed, linear sequence; each depends on, and feeds into, several of the others rather than only the one before or after it. Collective digital inclusion work, sustained by network weaving and shown at the centre, is what this interlocking process jointly produces. The smaller blue ovals surrounding each mechanism give concrete examples, drawn from our case, of how that mechanism is enacted in practice by DIN.

The contributions of our study are summarised in Table A2 (Appendix) and further discussed next.

5.2. Theoretical implications

Our study contributes to the digital inequalities discourse by proposing an alternative approach for framing digital inclusion, one that i) considers shifting from a deficit to a care perspective, ii) challenges traditional power dynamics, and iii) acknowledges the burden of care.

Existing policies and initiatives designed to address digital inequalities often frame these inequalities from a deficit perspective (Zamani & Vannini, 2025), suggesting that digital inclusion can be achieved through policy techno-fixes that facilitate access, and digital skills training targeting increased use (Zheng & Walsham, 2021). As a case in point, through a systematic literature review of the IS scholarship, Vassilakopoulou and Hustad (2023) show that a large majority of studies examining digital divides, advocate for policy interventions, skills training and design tailoring. We consider that focusing on this trifecta results in adopting an unproductive framing of digital inequalities (cf. Choudrie et al., 2021; Fisk et al., 2023; Lewis Ellison & Solomon, 2019 for critiques to deficit thinking within the digital divide discourse) that reproduces and reinforces structures of power (Federici, 2018; Gurumurthy, 2017), stereotypes and deficiencies, which oppress rather than empower the digitally excluded (Díaz Andrade & Techatassanasoontorn, 2021), and that tend to ultimately reproduce the very same (digital) inequalities they mean to combat. In addition, we highlight that the adoption of a deficit framing often results in digital inclusion initiatives of variable success and failures (Heeks, 2022; Madon et al., 2009; Mingers & Walsham, 2010), precisely because they consider digital inequalities as gaps that need to be bridged, without engaging with the root causes of the inequalities themselves.

Our study demonstrates that when digital inclusion is framed and enacted as care work, it actively subverts these traditional power dynamics. By

organising around a common objective, acknowledging interdependence, and sharing resources, caring networks redistribute power horizontally rather than hoarding it institutionally. Digital inclusion work as care work, as shown in our study, acknowledges the interdependence of actors, shares resources and insights, and enacts collective responsibility and reciprocity to reflect the values of ethics of care. We specifically argue that digital inclusion networks, mobilised by network weaving principles, can become caring networks by mobilising their “relational and situated knowledge, pluralistic voices and experiences, and relationships bound by mutual interdependence” (Sweeney & Rhinesmith, 2017, p. 1482). This, in our study, is also manifested by the virtuous circle of reciprocal care, characterised by the blurring of boundaries between providers and recipients. In this model, network members frequently oscillate between being beneficiaries of care and acting as its primary deliverers. The effectiveness and longevity of the network is rooted in this reciprocal infrastructure, which allows the network to expand and remain active without over-reliance on a top-down management parachuting of resources.

Moving from a deficit perspective to a perspective that seeks to provide tangible benefits and added value to people's lives requires knowing and understanding the personal circumstances of a diverse set of people, respecting their choices and understanding the contextual conditions (Díaz Andrade & Techatassanasoontorn, 2021). Here, community-based initiatives facilitated through weaving networks of care are likely better positioned to parse through the above, precisely because they are bottom-up and closer to the communities themselves (Mervyn et al., 2014). By functioning as a social infrastructure where digital initiatives are integrated into broader social programming (e.g., food pantries, community hubs), the network facilitates direct caregiving. This approach recognises that social (and digital) inclusion is most effective when embedded within trusted, everyday environments rather than within decontextualised or purely technical settings.

However, our results do highlight the burden of care inherent in transformative digital inclusion work, where caregiving is often an exhausting and challenging endeavour for practitioners (Palakshappa et al., 2024). By framing digital inclusion as care work, we expose the danger of it being misinterpreted as a low-skill or naturally occurring resource. Without deliberate institutional resourcing, this labour risks falling into the same trap as unpaid care, remaining invisible and under-compensated (Parsley & Johansson, 2025). Ensuring the longevity of these networks, therefore, requires a policy shift that explicitly

values the relational labour of caregivers as a professional and resource-intensive competency.

We are not the first to advocate for a change in the framing of digital inequalities and digital inclusion. Mingers and Walsham (2010), for example, argued that discourse ethics can inform digital inclusion projects while engaging with stakeholder groups. We note however that such an approach can only be useful to the extent that the requirement is that of a consensus among stakeholders (Habermas, 2004); considering the deepening structural inequalities at the backdrop of accelerated digitalisation, such an approach is insufficient, and enacting transformational changes with lasting positive impacts for all often necessitates challenging the structures of inequality and acknowledging the interdependency of digital inequalities. Therefore, we wish to join our voices with Sweeney and Rhinesmith (2017), and maintain that digital inclusion requires centring the discourse around relationships, interdependencies, support, empathy, and caring.

Our study also contributes to the literature by unpacking the underlying principles that allow digital inclusion networks to transform responses to systemic digital inequalities. First, our findings show that embodying Network Weaving principles can transform networks into caring entities. We further contribute to this understanding by mapping the NW principles across the four phases of care ethic and the mechanisms through which DIN enacts each: caring about is operationalised through a mechanism of attentiveness, reflected in how NW advocates for being supportive and intentional; caring for is operationalised through a mechanism of resourcing, also leveraging relationships to engage with resource identification; caregiving is operationalised through a mechanism of hands-on action, the core practice of taking action toward meeting digital inclusion needs; and care-receiving is operationalised through a mechanism of reciprocal re-entry, evidenced in the form of DIN beneficiaries coming back and taking on the role of carer themselves for those earlier in their own journey. In other words, we show that NW entails the cultivation of a caring network—one that is inherently attentive to communal needs and proactive in mobilising the collective actions required to address them.

Second, and more importantly, we show that NW principles facilitate creating a loop between the different care mechanisms, because these principles necessitate networks to be built on nurturing and reciprocal relationships rather than hierarchical structures of dependencies, which is central to care work (Bendl et al., 2019): care-receivers (i.e., organisations who benefit from digital inclusion initiatives) become caregivers themselves (i.e., sharing insights, best practices, and tangible support), thus creating a virtuous circle whereby the care network

expands, remains active, and achieves their digital inclusion objectives. Through this virtuous circle, care ceases to be a top-down provision that maintains a power imbalance between the provider and the receiver. Instead, the continuous looping of care roles becomes the very mechanism through which power is dispersed and shared among all network participants. As such, we introduce NW as a way for leveraging collective dynamics for remaining attuned to the realities of people experiencing exclusion and marginalisation (Kvasny, 2006; Masiero, 2018), and for engaging in care work in a fashion that by default allows care work to come in full circle (Tronto, 1998). In this respect, we further contribute by providing the empirical evidence for Saks and Gruman's (2024, p. 10) that, within a culture of care, "those who receive care from the organization and other stakeholders will return that care to the organization and [...]his creates a virtuous cycle of caring that is sensitive to people's needs and can help to mitigate the dehumanizing effects of technology".

Taken together, these findings point to a further, perhaps more fundamental, theoretical contribution: the explicitly collective, rather than individualistic, nature of this process. This collective quality means NW does not operate as a top-down mechanism for granting individuals access to digital technologies or skills training as discrete, separately delivered goods, but rather positions digital inclusion itself as a collective undertaking, achieved cumulatively as members move between being supported and supporting others. This is what allows DIN to avoid the pitfalls of the off-the-shelf, uniformly applied interventions: empowerment is generated collectively and relationally, rather than delivered as a packaged solution, and thus it remains responsive to the local context even as the network scales. NW, in other words, does not merely distribute existing resources more efficiently among individual beneficiaries but generates new collective capacity, knowledge, and reach as the network grows. This generative, collective dynamic is what Figure 2 depicts as a self-sustaining loop, rather than a linear sequence of discrete care activities.



Figure 2. A cyclical model of care mechanisms in digital inclusion networks.

5.3. Practical and policy implications

Our findings further hold significant insights for practitioners and policy makers, who are involved in digital inclusion networks or initiatives and policies that aim at addressing digital inequalities. We show the value of considering these through the lens of Networking Weaving. Specifically, our findings indicate that being able to address digital inequalities through networks, it is crucial to know and appreciate the contextual conditions that influence, and shape said inequalities. In addition, our analysis further illustrates that working toward addressing digital inequalities is a relational process, that reflects caring practices where people adopt and enact several roles, as they work across and represent different organisations. On the basis of this, we present our insights for practice in Table 4.

In addition, and because we consider digital inclusion to be also a policy-level problem, we further propose a reflective tool, inspired and influenced by our findings, and specifically for policy-makers engaged in digital inequalities work (Table A3, Appendix). We have structured this tool as a series of reflective questions, which are mobilised by the principles of Network Weaving as praxis and of ethics of care ethic as theory, and whose aim is to encourage purposeful thought and deliberation on what is required to address digital inequalities. The inspiration behind this tool stems from the method of provocation, often used in psychology and social work, and other Social Sciences, where the aim is to illuminate often ignored phenomena and arrive to solutions that are desirable and fit for purpose. In other words, the aim of the provocation “is to encourage critical reflection and potentially transform behaviours”, while encouraging policy makers and practitioners “to consider the kind of world that is enacted through [this] process” (Pangrazio, 2017, p. 227). Therefore, the objective of this tool is not be used as a checklist but as a tool that can indeed lead to transformational change by inviting policy makers and practitioners in “reconsidering their points of view, demonstrating

forms of conscious reflection or alternative perspective-taking” (Roussou et al., 2019, p. 3).

We note that the relationship between each question and the corresponding principle is not strictly one-to-one but acknowledge that these are intertwined and interdependent to each other, whereby considering ways to address a single question may support working toward more than one of these principles. We also note that we have not included reflective prompts for the principle of intentionality: this is purposeful as we developed this tool on the assumption that policy makers and practitioners interested in adopting this reflective tool as part of their practice will be doing so consciously and with the expressed intention to enable networking for combating digital inequalities.

6. Conclusions and future research

In this paper, we focused on examining a digital inclusion network as a bottom-up approach, with the view to understand how such networks leverage relational care-driven practices to transform responses to systemic digital inequalities. Our findings indicate that DIN, a prominent digital inclusion network based in a rural county in the UK, exemplifies the principles of Network Weaving (NW), and by doing so it operates with a clear and intentional mandate to mitigate digital inequalities by cultivating supportive and nurturing relationships among a diverse array of stakeholders. This relational approach ensures sustained engagement with the initiatives necessary to foster digital inclusion across the county. At the same time, it also suggests that the network’s effectiveness stems from its departure from the usual top-down, transactional frameworks that primarily view digital inequalities from a deficit perspective, and precisely from the network embodying a model characterised by care and reciprocity. In this respect, the application of NW principles within DIN can be understood as operationalising an ethic of care, which fundamentally disrupts traditional power imbalances by centring grassroots relational support over institutional control.

Table 4. Practical insights.

Recommendation	Relevance to Stakeholders	Implementation Challenge
Trusted local organisations are effective delivery agents	Councils/charities can work through existing community partners already trusted by residents	Some areas may lack strong community organisations and/or local capacity, and thus difficult to scale
Mapping digital exclusion risk and local provision improves targeting	This can help policymakers allocate resources to underserved places and populations, as it combines data with community knowledge	Mapping may miss hidden exclusion or quickly become outdated, as it is conducted voluntarily; may oversimplify lived exclusions and might miss invisible groups
Embedding support in familiar spaces (libraries, food banks, cafés, halls) increases uptake	This approach reduces stigma and improves engagement through accessible, everyday venues	It requires staffing, coordination, and venue availability and sustainability, because it is resource-intensive and dependent on volunteers and community spaces
Peer-learning and flexible partnerships enable diffusion of effective practices and opportunistic collaborations	Organisations can replicate what works without reinventing solutions, and can respond quickly to local challenges when opportunities arise	Peer-learning is informal and thus may lack consistency; coordination among partners will become more complex as the network grows

Along these lines, our findings advocate for considering digital inclusion work as care work. We consider that changing how digital inequalities are framed and how they are addressed is of distinct importance, particularly today because the accelerated pace of digitalisation across all aspects of everyday life has further deepened inequalities (Zamani & Rousaki, 2024). The literature already indicates very vividly that all too often digital inclusion programmes and policies fail to address digital inequalities effectively due to flawed assumptions regarding digitalisation's benefits (Díaz Andrade & Techatassanasoontorn, 2021; Zamani & Rousaki, 2024), simplistic approaches to who are the excluded and why (Zheng & Walsham, 2021), due to lack of community and government support, and even due to such programmes not adding value to people's lives (Mervyn et al., 2014; Zheng & Walsham, 2021). Approaching digital inclusion work as care work helps us address what might be valuable and needed, and how these might be achieved.

Digital inclusion networks can provide this care work; yet they remain rather underexplored and under-theorised, despite representing a promising area within the discourse of digital inclusion and inequalities. Within social systems, networks of people and organisations can function as foundational support structures that facilitate meaningful connections and interactions and essential exchanges (Castells, 2000). Further, they make possible taking stock and leveraging community-based assets (time, effort, resources, people) to challenge preconceived notions of inclusion and exclusion and challenge power structures (Holley, 2013). At the same time, we wish to draw attention to some inherent problems in terms of addressing digital inequalities through network weaving and care work. Turning to self-organised, community-driven networks to address digital inequalities endangers framing institutional support and relevant government policies as unnecessary or irrelevant. In addition, caregiving and functioning as a caring network is often overwhelming:

It's been exhausting at times. It has been challenging because ... it's taken me right out of my comfort zone at times because there's so many different themes where digital overlaps and they're not necessarily where you have any expertise in or any standing. Whereas everyone seems to be an expert in their own particular field so it's quite hard. (L4)

This invokes the discourse around the burden of caring and caregiving, in terms of recognising the need for care, and taking responsibility for meeting people's needs (Maeckelberghe, 2004). While our findings show that even when caregivers do not have the capacity, capabilities, and resources to support others, they still do so precisely because they care, i.e., they appreciate that addressing digital inequalities requires

interdependent work and engaging and connecting with everyone to achieve digital inclusion for everyone. As such, much like unpaid care work, digital inclusion work risks being misinterpreted, undervalued, and "passed off as not essential or productive", precisely because it is unpaid and/or not resourced by governments (Klein, 2021, p. 1478).

Our study comes with certain limitations. A primary limitation of this research is the scale of transformation observed. Although the DIN successfully disrupts traditional power dynamics, it falls short of the systemic 'dismantling' described by feminist thinkers as a prerequisite for true liberation (hooks, 2000). Feminist thinkers envision transformational change as the profound restructuring of social, political, and economic systems that moves beyond superficial reforms and specifically seeks to address the root causes of inequalities and intersecting forms of oppression (Vannini et al., 2024). In many cases, this reflects a need to completely dismantle interlocking systems of subjugation (hooks, 2000). However, our findings offer a nuanced contribution: they show that deeply impactful change and power redistribution can be achieved through care-based, incremental approaches. We demonstrate that care can serve as a radical mechanism for empowerment, allowing communities to negotiate and resist power even when they are unable to fundamentally restructure the broader capitalistic systems in which they are embedded. As such, and while we acknowledge that digital inclusion networks are still required to work within capitalistic systems, we show that transformational change and meaningful redistribution of power can still be achieved through incremental approaches and working within existing power structures, using care as a radical tool for grassroots empowerment without fundamentally altering them.

Another limitation stems from the cross-sectional nature of our study. We began engaging with DIN in 2023, about a year after they launched their operations. By that point, DIN was already making significant progress and achieving beneficial and transformative changes in the county in terms of digital inclusion. We have continued to engage with the network over the years, witnessing its growth and scaling up of support offered to its member organisations. Nevertheless, this timeframe does not allow us to consider long-term effects, nor the many ways in which DIN may evolve over time. Therefore, future studies could adopt an extended longitudinal design, which could provide insights in terms of how the Network Weaving principles evolve alongside the evolution of the network itself.

In relation to this, we also note two further scope limitations regarding context. First, our focus was on a specific county in the UK, characterised by increased rurality. While rurality has been identified by earlier studies as a possible factor for digital inequalities

(Zamani & Vannini, 2022), several other factors also influence inequalities, such as gender, socio-economic status, faith and disability (Hustad et al., 2019; Vassilakopoulou & Hustad, 2023), to name only a few, and which our case does not allow us to disentangle. Second, our findings report on a western-based digital inclusion network operating within a Global North country, where the root causes of digital exclusion and inequalities often differ markedly from those in the global South (Heeks, 2022). Future studies would therefore benefit from considering and evaluating different approaches originating in the Global South, as well as from research designs capable of isolating the relative contribution of rurality alongside these other, intersecting factors of disadvantage.

Note

1. The name has been replaced for anonymisation purposes.

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Author contributions

CRedit: **Sara Vannini**: Conceptualization, Formal analysis, Funding acquisition, Investigation, Writing – original draft, Writing – review & editing; **Sharon Wagg**: Conceptualization, Formal analysis, Funding acquisition, Project administration; **Efpraxia D. Zamani**: Conceptualization, Formal analysis, Funding acquisition, Investigation, Methodology, Writing – original draft, Writing – review & editing.

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Data availability statement

The data that support the findings of this study are available on request from the corresponding author.

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Appendix

Table A1. Process of Data Analysis

Stage	Aim	Method
1. Familiarisation	To identify the major themes within each transcript.	Close reading of the transcripts, memoing, consulting observation and other notes.
2. Analytical (first tier)	To identify and consider similarities/differences across transcripts; To identify elements/practices of NW.	Initial coding: material was coded line-by-line and around the NW principles (within and across transcripts). Exemplary practices and processes were bracketed (e.g., mapping, surveying, workshops) and mapped across the NW principles. Findings are shown in Table 3: the 2nd column includes the NW principles, and the 3rd column provides a description of what these mean within the DIN context. The 4th column contains exemplary quotes.
3. Analytical (second tier)	To reconsider the themes emerging from Stage 2; To identify emerging patterns, and relationships between themes.	Secondary coding: raw and coded material (i.e., from Stage 2) was coded line-by-line. At this stage, the relevance of care ethics began emerging. For example, it was observed that the value of being supportive and intentional (both NW principles) enable allow DIN to keep its ear close to the ground and identify real rather than perceived needs for support (caring about). Findings are shown in Table 3: the NW principles are mapped against the care phases.
4. Code review	To consider and ensure the coding scheme reflects the aims of the study, and that it is exhaustive; final code labelling.	All authors reviewed the evolving coding scheme, looking for possible overlaps, misinterpretations and overinterpretations, and that all relevant material (from transcripts, observations, notes, website) has been considered and coded. Existing literature was revisited to ensure robust understanding of our data and codes; supplementary material (website, notes etc) was reconsidered and used for clarifications where needed. An example of this review: care-receiving has been earlier labelled as 'being sharing-focused'; however, based on revisiting the literature, we identified that reciprocity is part of care-receiving (the last phase of care that closes the loop). The code thus became more focused and then relabelled.
5. Report and Write Up	To develop the study's chain of evidence; To prepare and present the study's findings.	We identified representative extracts from our material to illustrate the final coding (Table 4, 'Examples'). Developed Tables 3 and 4. Developed Figure 1. This also informed the presentation of our Findings (Section 4) and Discussion (Section5), the latter further supported by revisiting once again the existing literature.

Table A2. Theoretical contributions.

Contribution	Added value	Critique and Remaining Gaps	Future Research Opportunities
Reframing of digital inclusion as care work rather than technical provision	Conceptual shift beyond deficit models (relational and sociopolitical understanding of exclusion); timely for digital-by-default contexts	Care can be normative and difficult to operationalise consistently; unclear how to measure care-driven inclusion	Metrics for care-based digital inclusion effectiveness
Integration of ethics of care with network weaving	An original interdisciplinary framework that bridges feminist theory and network practice	The framework may privilege cooperation while underplaying conflicts, tensions, and competing agendas	How care networks manage disagreement, burnout, conflict resolution and governance tensions
Digital exclusion is a relational deprivation	Richer explanation that access-only and deficit models	Risks underemphasising material constraints (e.g., affordability, infrastructure); relational versus economic barriers	Comparative studies isolating and examining relational and material drivers
Networks of care as an organisational form, challenging top-down governance logics	Digital inclusion emerges through ecosystems of reciprocal actors rather than isolated programmes; relational, bottom-up programmes may outperform centralised interventions	Transferability is uncertain because the study is based on a successful exemplar case. It also risks creating a false dichotomy between top-down /bottom-up approaches	Comparative studies of successful/ unsuccessful networks, and exploration of hybrid models (combination of policy-driven and local-driven)
Digital inclusion as a collective, generative process rather than an individually delivered good	Capacity for digital inclusion work is distributed across the network rather than concentrated in any single organisation or programme, and expands as members move between being supported and supporting others	Difficult to isolate the relative contribution of the collective dynamic from other factors (e.g., funding, leadership); risk of assuming collective dynamics emerge automatically once a network exists	Comparative studies of networks with and without strong collective/reciprocal dynamics; measures of distributed capacity over time
Rural perspective to digital inequality	Geography and rurality are structurally embedded dimensions of exclusion	Urban or densely populated contexts may differ	Cross-rural and urban theorisations
Emphasises reciprocity, whereby recipients become contributors	Moving beyond passive beneficiary models	Reciprocity may not occur equally for vulnerable groups with fewer resources or more complex lived experiences	Investigation of which groups can and cannot reciprocate and why; inclusion studies of unequal participation to identify hidden exclusions

Table A3. Reflective questions for policy inquiry.

Principle	Reflective prompts to thinking about digital inclusion initiatives
Fostering relationships	(1) How can policy encourage shifting from hierarchical structures to peer-based relationships in digital inclusion programmes? (2) How can policies ensure that bottom-up contributions are recognized and valued? (3) In what ways can practice promote cross-fertilisation and knowledge sharing through networks?
Centring support	(1) How can digital inclusion policies support networks with the capacity to provide the necessary support? (2) What policy initiatives can be introduced to promote network building and knowledge sharing? (3) What strategies can be implemented in practice to prioritise care and support?
Action-orientated	(1) How can digital inclusion policies be designed to encourage active opportunity-seeking, enabling quick action and responsiveness to emerging needs of digital inclusion initiatives? (2) What policy frameworks can be developed to foster innovation in digital inclusion efforts, particularly by embracing novel approaches and supporting creativity and experimentation? (3) How can policies support local flexibility to adapt, scale and innovate? (4) What steps can be taken to create and support flexible, non-rigid organisational structures in digital inclusion initiatives, allowing for more dynamic and effective responses to challenges?