DIGITAL INEQUALITY IN A RURAL CORNISH VILLAGE: AN INTEGRATIVE ANALYSIS

by

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DECLARATION

I, Abril Herrera Chávez confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.
ABSTRACT

Over the last three decades, the development of Information and Communication Technologies (ICTs) has transformed human societies. This digitisation is commonly believed to make all residents’ lives easier, healthier, and more productive by reducing spatiotemporal constraints for accessing information or services. However, this optimistic view neglects the situation of disadvantaged populations who may not be able to access or use ICTs in the same way and are, therefore, at risk of being left behind and excluded from an increasingly digitised society. Such inequalities in the access and use of digital technologies are referred to as the digital divide and have been studied extensively. Research on the digital divide is typically based on ‘Big Data’ from national surveys that are useful for revealing general trends and usage patterns but neglect the situation of small rural areas that are underrepresented in surveys. These areas are often structurally disadvantaged for several reasons, such as spatial isolation, poor infrastructure, low population density, or the out-migration of businesses and young people. Digitisation has the potential to mitigate some of those challenges, but despite recent efforts to investigate technology use in rural communities, very little is known about the role of ICTs in the everyday life of rural residents and about the practical barriers that may hinder their adoption. This thesis aimed to fill this data gap by developing an integrative bottom-up research approach that examined technology use in a rural Cornish area at multiple levels, with convergent methods and minimal preconceptions about normative forms of ICT use. This approach enabled the collection of ‘Small Data’ that portrays the use of technology in the inhabitants’ life context and delineates how personal characteristics of individuals, socio-cultural
characteristics of the local community, and structural characteristics of the area collectively shape digital divides in the rural environment.
IMPACT STATEMENT

The research presented in this thesis about Internet access in rural neighbourhoods has enhanced the understanding of person, community, and area factors that determine the differentiated levels of Internet use in small areas.

The content and the strategies employed on this thesis provide a general toolkit to enrich the understanding of local areas, such as neighbourhoods or villages, regarding access to different types of infrastructure (not only the Internet).

This research developed a novel mixed-methods approach combining qualitative and quantitative techniques. An initial pilot stage was informed through the local knowledge about the distribution of the area, the links between the neighbourhoods and segregations of the population that were not evident in spatial visualisations. The project was conducted in collaboration with the local community centre, which facilitated the generation of trust bonds with key informants, gatekeepers and a small number of the inhabitants of the village who, similarly to a snowball, spread the voice about the utility of this research project for a better understanding of Internet access. In a subsequent second study stage, convergent methodologies (including a face-to-face household survey, interviews, and observations) were applied to obtain rich and integrative insights about characteristics of individuals, the local community, and the rural study site that collectively shaped inhabitants’ access to new technologies and that are commonly neglected in large-scale studies of urban environments.
The results of this small-area study were also used to inform the local population and the community centre through public engagement workshops about pre-existing digital divides in their neighbourhoods, the spatial distribution of these divides and the influence that their spatial location have on the quality of the Internet service they would receive.

Based on the obtained results, a model of Internet access was generated that was tailored to the area under investigation. This model could inform further strategies to tackle disconnection in areas with similar spatial and demographic characteristics (e.g., elderly populations in highly rural and segregated areas).

At a time in which big data are seen as the response to most contemporary social and spatial problems, this thesis highlighted the importance of small-area studies that allow filling the gaps of unavailable or inexistent information by customising research methods and explanatory models for a better understanding of areas that are at risk of being left behind and becoming excluded from an increasingly digitised society.

Results of this research have been presented at international conferences on co-creative research, e-planning and media studies and disseminated through workshops with the local population. The methods presented in this project have the potential to contribute to urban planning and media studies curricula towards a stronger emphasis on the importance of area studies and multi-method approaches. This research could also yield benefits outside academia by informing the development of tools for assessing the impact of local and regional-scale infrastructural developments and urban expansion.
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Chapter 1. Internet connectivity and the digital divides in the rural Cornwall
1.1 THE DIGITAL DIVIDES

The last three decades have seen a tremendous rise in applications of digital technologies that are collectively rooted in the development of the Internet (Castells, 2014; Minges, 2016). Since its introduction to the public in the early 90s, the Internet seems to have transformed our societies by permeating virtually all domains of human life (Castells, 2000; 2005). From communication to education, access to public services, shopping, socialising, dating, or working, there are hardly any aspects of urban life that have not become digitised. Moreover, our future seems likely to become even more digitised with prospects like self-driving cars, e-health care systems and fully connected smart cities on the horizon. This increasing digitisation of society is commonly seen as a driver of progress that will ultimately yield benefits for everyone (Latham & Sassen, 2005; Finger & Razaghi, 2017; Brandt et al., 2018), e.g., by reducing the spatial and temporal constraints for accessing knowledge and services and by creating new opportunities, professions, and even markets. This optimistic view is problematic, however, as it overlooks the risks that ever-increasing digitisation of societies can entail for structurally disadvantaged populations who, being at the margins of society, face different challenges to access and/or use digital technologies and are therefore at risk of being left behind and excluded from the emerging digital spheres of our societies (van Dijk, 2003; 2005; 2006; 2020; van Deursen & van Dijk, 2019; Helsper, 2008; 2012; 2021).

Until recently, rural areas in developed countries were typically regarded as peaceful regions where residents preferred to disconnect from the fast-paced urban lifestyle and embrace face-to-face interactions. However, the COVID-19 pandemic of 2020 revealed the stark disparities in digital technologies, infrastructure, and services that rural populations
encounter on a daily basis, and how these disadvantages can prove threatening in times of crisis.

The inequalities in the access to digital technologies initially referred to as the *digital divide*, has been the subject of extensive research (see Chapter 2 for a detailed overview). Contemporary research distinguishes between at least three levels at which digital divides can manifest. The first level refers to inequalities in physical access to digital infrastructure (van Dijk, 2003; 2005; 2006; 2020). During the early stages of Internet diffusion in the 90s, when network penetration was much sparser and information and communication technologies (ICTs) much more expensive than nowadays, researchers were primarily concerned with understanding who was connected to the Internet and who was not (Norris, 2001). As detailed in Chapter 2, this question was asked at various levels, from differences between individuals to differences between neighbourhoods or even entire countries, generally revealing that economic inequalities are a major source of disparity in Internet access too. For example, at the level of individuals, ICTs were simply unaffordable for people on a low income. Likewise, at the level of neighbourhoods and countries, inhabitants of economically disadvantaged areas (e.g., developing countries) were unlikely to connect due to the poor access to digital infrastructure within their context (Chen & Wellman, 2004; Fong, 2009). Regardless of the scale, the critical implicit assumption behind this research was that gaps in the physical access to Internet infrastructure constitute the primary reason for the digital divide; and that extending technological access to economically disadvantaged people and regions would allow them to integrate into the newly emerging global digital economies (Rogers, 2001; Spector, 2000; Hawkins & Hawkins, 2003).
Since the early stages of Internet diffusion, access gaps have become considerably smaller, especially within countries in the Global North, due to enhanced network penetration and the reduced cost of ICTs. Importantly, however, research has shown that differences in Internet use among inhabitants continue to exist even in places where the differences in physical access to the Internet have become relatively small (DiMaggio et al., 2004; Van Deursen & Van Dijk, 2015). This phenomenon is referred to as the second level of the digital divide (Hargittai, 2002) and illustrates that extending technological access constitutes only a first step toward tackling digital inequality. As detailed in Chapter 2, novel frameworks have been developed to account for the second level of the digital divide, shifting the focus from infrastructure toward people’s skills and motives to use the Internet (Selwyn 2004; van Dijk and Hacker 2003; van Dijk, 2006; Hargittai 2002). This perspective has also had a strong impact on digital policies, where a better promotion of digital skills in the population is commonly seen as the key ingredient for unlocking the full economic potential of the Internet for society (Van Dijk & Van Deursen, 2014).

A more recent development in research on the digital divide has been an increased focus on the outcomes that people achieve from particular online activities. This line of work has revealed that digital activities do not lead to universal outcomes for everyone, even after controlling for differences in access, skills, and usage patterns (Van Deursen & Helsper, 2015; Wei et al., 2011). This phenomenon has been referred to as the third level of the digital divide (Van Deursen & Helsper, 2015) and it emphasises that the effective use of digital technologies is constrained by people’s resources in other life domains (e.g., their available economic capital, education, cultural background, social networks, or particular
As detailed in Chapter 2, this line of work has led to new perspectives on the digital divides that cast multiple inequalities as the result of interactions between domain-specific offline and online resources (e.g., Helsper, 2012; Ragnedda, 2017).

Figure 1. The Three Levels of the Digital Divide

1.2 THE DIGITAL DIVIDES IN RURAL AREAS

A fundamental limitation of research on the digital divide has been that the vast majority of studies have examined populations in urban environments. In fact, most theories and frameworks on the digital dive as well as digital policies are based on findings from large-scale national surveys usually collected by phone or email (e.g., in the UK, Ofcom is one of the main national sources of information about Internet access and use currently collects most of its surveys online and some by post). Such ‘large-scale’ approaches have undeniable virtues, and they are certainly well suited to identify general trends and technology usage patterns at larger spatial scales. However, a singular focus on the ‘bigger picture’ undoubtedly neglects the situation of disadvantaged groups, such as...
those living in remote rural areas, whose characteristics and needs are typically underrepresented in national survey samples. This lack of research on technology use in rural areas can have severe consequences for the inhabitants of those regions. Rural areas tend to be structurally marginalised for several reasons, e.g., due to their spatial isolation, poor infrastructure, ageing populations, and their persistent dependence on the primary economy (Brouwer and Berkum, 1996; Bock, 2016). Moreover, the low population density that is commonly observed in rural areas discourages investments in infrastructure (LaRose et al., 2008).

Importantly, digital technologies have the potential to mitigate at least some of the disadvantages that prevail in rural communities. For example, digitisation of public services could enhance the level of access for inhabitants of rural areas that otherwise face a strong spatial penalty when trying to access those services manually. Critically, improving access to services and communication channels could also provide new business opportunities, which could lead to a re-migration of younger people to those areas, resulting in a virtuous cycle where investment in the areas may become successively more attractive (Roberts et al., 2017). Conversely, a lack of access to digital technologies could amplify the pre-existing disadvantages of rural areas, preventing inhabitants from participating in a largely digitised society and making these areas less attractive for young people, businesses, and investors (van Wrinkle et al., 2017). Collectively, these considerations illustrate the urgent need for research to examine the adoption of digital technologies in the rural environment.

As a consequence, more recent studies have examined Internet use in rural areas. Two different lines of research have been conducted that
have used very different approaches and provided complementary insights. The first line of research has examined large-scale data sets with quantitative techniques to establish correlations between the spatial distribution of Internet use and indices of economic deprivation (e.g., Anderson, 2007; Longley & Singleton, 2009; Philipp et al., 2015; 2017). As detailed in Chapter 2, these studies have consistently established links between an area’s level of material deprivation and the level of technology use among its inhabitants. However, on their own, such links provide only very limited insights into the issues surrounding technology adoption in rural areas, as they are highly descriptive and provide no explanation as to why links between different forms of deprivation exist in the first place. This leaves important analytic questions unanswered, e.g., if an area’s lack of digital inclusion should be considered a cause or a consequence of its economic deprivation (Helsper, 2021). Answering these questions is essential, as it dictates the nature of digital interventions and policies that may be conducted to improve the situation in rural areas. In addition, since these studies are based entirely on uncontextualized large-scale data sets, they neglect the different life contexts of the inhabitants of rural areas, in which technologies may play a very different role than in the urban environment.

A second independent line of research has studied technology use in rural communities via qualitative methods, such as observations and interviews (e.g., Ashmore et al., 2015; Williams et al., 2016; Correa and Pavez, 2016; Pavez et al., 2017; Reisdorf et al., 2016). These studies have begun to fill the outlined data gap on technology use in the rural environment, obtaining valuable situated knowledge about the role of new technologies in the everyday life of rural communities and about the barriers to their adoption. According to Lefebvre, everyday life describes
the continual recurrence of behavioural patterns that is present in all spheres of social life, including the work, family, and leisure time (Lefebvre, 1947). In his critiques of modern capitalist culture, he argued that everyday life had been turned into a domain of consumption that alienates people from themselves and mainly serves to perpetuate the status quo (capitalism), unless people can become aware of these patterns of alienation and actively transform it to seek individuality and self-expression. As detailed in Chapter 2, these studies have documented several reasons why inhabitants of rural areas may struggle with new technologies or choose not to go online at all, even when the necessary infrastructure is available to them. Recurring themes in these studies were that inhabitants might lack confidence in their ability to use digital technologies, often paired with a fear of uncertain situations. In some cases, social support (especially from young people with high technology confidence) could facilitate people’s ability to access the Internet. However, some observations also suggested that the availability of more knowledgeable peers can lead inhabitants to establish patterns of proxy use, whereby their peers will access the Internet on their behalf. Overall, these pioneering studies have been of great value for developing an initial understanding of technology use in the rural environment. Nonetheless, it should be emphasised that these studies were based exclusively on qualitative methods that, by definition, depended on the subjective perspective of the researcher; and they examined only very small samples of inhabitants that were by no means representative of the local populations. Accordingly, these findings should be considered with caution until they can be confirmed in follow-up studies with larger and more representative samples and with more comprehensive methodologies.
1.3 LIMITATIONS OF PREVIOUS RESEARCH AND AIMS OF THE CURRENT STUDY

As outlined in the previous sections, research on the digital divide has focused predominantly on technology use in the urban environment and only recently have scholars begun to consider how digital technologies are being adopted in rural areas. This question is of great importance, as digital technologies have the potential to mitigate at least some of the structural disadvantages of rural areas.

While recent studies have started to provide insight into the issues surrounding the adoption of new technologies in rural areas, these studies present several important limitations, necessitating more targeted research and theorisation. As noted above, extant studies are often based on a very small number of observations and tend to have a rather narrow focus on specific aspects of the digital divide, e.g., how an area’s material deprivation or an individual’s attitudes toward technology correlates with their level of digital engagement. What is currently missing are attempts to explain rather than describe the distribution of digital inequality and to link different levels of analysis from individuals to communities to situated areas.

Moreover, most research on the digital divide has adopted a top-down perspective, whereby researchers define a set of supposedly desirable digital skills and activities as the ultimate end goal for everyone. Such definitions are often arbitrary, or they may be based on labour market demands. Either way, they neglect the first-person perspective of technology use, wherein the value of digital activities is highly subjective and dependent on an individual’s life context. This normative approach entails a great risk of imposing idiosyncratic and/or neoliberal ideals.
about the use of technology onto people who may not share the same values; and of missing alternative forms of technology use that may not immediately seem beneficial to researchers but may nonetheless provide very valuable outcomes for individuals. Put simply, research should focus not only on what people should do online but also on what they actually want to do and how they can be empowered to do so.

Considering the outlined limitations, the current study aimed to advance the understanding of digital inequality in rural areas in several ways. Firstly, in keeping with the recent efforts of other scholars (e.g., Correa and Pavez, 2016; Reisdorf et al., 2016), it aimed to fill the current information gap about technology use in rural areas and create area-based knowledge about factors shaping the digital divide in a rural study site. Secondly, it aimed to develop a collaborative bottom-up approach that would avoid the drawbacks of current normative approaches (see above) and facilitate understanding the role of technologies in the everyday life of local inhabitants with minimal preconceptions. Thirdly, through the convergent use of different methodologies (see next section and Chapter 3 for details), the study aimed to analyse and integrate different aspects of the digital divide, from structural and historic characteristics of the area to demographic and psychosocial characteristics of individuals and the local community, providing a richer and more situated account of digital inequality. Lastly, the thesis aimed to overcome the rather static view on digital inequality that is prevalent in the current literature. Theories are static in the sense that they usually merely seek to establish links between digital and socio-economic indices of inequality, while neglecting potential mechanisms by which these links could be dynamically strengthened or weakened. This thesis focused on going beyond such general links to delineate how different variables like
social capital and internalised attitudes about technologies (norms and socialisation) could mitigate or ameliorate the effects of well-established socio-economic factors on digital engagement.

As a whole, the thesis attempted to help advance theories of the digital inequalities by providing currently lacking insights into the causes and consequences of digital divides in rural areas and to produce actionable insights for interventions and small areas studies in similar settings.

It should be noted that at the time when this research was initiated, there was hardly any research that had taken an integrative approach to understanding the digital divide. Despite this theoretical and methodological limitation, the research was developed with the valuable input from the inhabitants of Pendeen, whose experiences and perspectives shaped the development of the study. Through collaboration with the village residents and participants, this research was able to delineate the spatial, infrastructural, individual, and social barriers to technology use faced by the community on a daily basis.

Interestingly, in recent years, the theories of the digital divide have evolved, and some new frameworks propose shifting from analysing the cumulative factors that limit technology use toward explaining the complex and dynamic ways in which digital technologies interact with social and environmental factors to create and reproduce inequalities. Intriguingly, by developing a multidimensional approach, the current thesis ended up providing strong supporting evidence for these socio-digital ‘ecological’ frameworks that were developed after this research was initiated and data was collected.
1.4 STRUCTURE OF THE THESIS

To accomplish the outlined study aims, the research presented in this thesis investigated the use of digital technologies in the village of Pendeen, a remote rural area in Cornwall. Traditionally developed as a mining area, Pendeen has been a focus of attention for different development projects, as it can be considered one of the ‘final few’ locations in the UK receiving poor quality Internet service (when available) and with a population that presents different individual and structural difficulties that undermine the use of digital technologies. In 2014, Cornwall underwent a massive rollout of superfast broadband through a regional development initiative (Superfast Cornwall, 2014; 2017a; 2017b), making Pendeen an ideal study site to examine how digital technologies were adopted in the rural UK. An integrative research approach was developed to understand Internet adoption in a locality by considering individual, structural-historical, and socio-cultural factors through the use of multiple convergent methodologies, as briefly outlined below.

Initially, Chapter 2 discusses the different theoretical frameworks within which the digital divide has been studied, distinguishing at least three different levels of divides (van Deursen & Helsper, 2015), and illustrating how relevant theoretical concepts have evolved over time.

Chapter 3 provides an overview of the methodology developed to analyse the digital divide in the case study. Overall, this methodology comprised two sequential study phases. In the initial phase, a rapid assessment was conducted to gain entry into the study site, earn the inhabitants’ trust and understand the role of digital technologies in their everyday lives with minimal preconception. In the second study phase, a
A combination of different methods was used - including a face-to-face household survey, interviews of inhabitants, and observation of patterns of life within the community - to obtain a rich and integrative perspective on issues shaping digital inequalities in Pendeen.

Chapter 4 reports the results of the rapid assessment from the first study phase. Different co-creative activities were conducted to encourage the inhabitants to describe the role of digital technologies in their everyday life and to outline the barriers and facilitators of ICT use. Based on the results of this rapid assessment, a multi-method approach was developed for the second study phase to examine different aspects of the digital divide in Pendeen.

Chapter 5 reports on the results of the household survey that was conducted in Pendeen as part of the second study phase. Quantitative analysis methods are used to examine links between individual person variables and digital engagement. A broad spectrum of person variables was considered in the survey, beyond mere demographics, facilitating the development of rich profiles of users and non-users of the Internet. Furthermore, regression analyses were used to identify unique predictor variables of Internet use and examine mechanisms by which they interact. One key result from this chapter pertains to the important role of inhabitants’ level of available social support, which predicts both the likelihood of engaging with the Internet at all and the number of activities for which it is used; and which also appears to mitigate the negative effects of other predictor variables.

Chapter 6 takes a complementary approach and examines the digital divide in Pendeen via an analysis of Pendeen’s history as a former mining area and its current status as a conservation area. This analysis identifies
several ways by which Pendeen’s past continues to impact its present and shape people’s access to digital technologies. Three key results are reported in this chapter: firstly, Pendeen’s current status as a conservation area that exhibits the remains of its mining past to tourists places strong constraints on possible improvements of the currently deficient infrastructure. Secondly, the perpetuating emphasis on Pendeen’s mining past is also reflected in patterns of life in the community, especially among those inhabitants whose families have lived in Pendeen for generations. These ‘traditional locals’ tend to segregate from newcomers who relocated to Pendeen more recently and often perceive technologies as part of an urban lifestyle that appears frustrating and offers little utility to them. Lastly, social interaction in public and semi-public gathering places can serve to overcome barriers to technology access, but those facilitatory effects are heavily constrained by the level of mixing between social groups within the village.

Chapter 7 aims to integrate the perspectives from the previous two chapters through a careful qualitative analysis of the life narratives of individual inhabitants. This analysis provides a window to examine the multiple socio-cultural factors that support or hinder the digital divide in the village. It leads to several key results that clarify, differentiate and/or challenge results from the survey, e.g., the different forms that social support with digital technologies can take, the importance of subjective outcomes of digital activities, or the diverse and gradually varying levels of access to the Internet among the inhabitants.

Finally, Chapter 8 synthesises the results from the different chapters in a general discussion about their implications for digital divide research and
interventions, as well as limitations and recommendations for future research.

As a whole, this integrative research approach produced rich insights into the way digital technologies were embedded into the everyday life within the rural study site and what factors determine the digital capabilities of its inhabitants. The following chapters describe the methods and results of the study in detail.
Chapter 2. The theories of the digital divide
2.1 INTRODUCTION

The Internet has been seen around the world as a medium capable of accelerating human progress (European Commission, 2010; World Bank, 2008), with the potential ‘for reorganising [the] productive processes and the transactions of goods and services; the development of new industries and business organisations, new products and services, ultimately associated with the rise of new markets; and the building of a new technology but also economic and social infrastructure’ (Gualerzi, 2010: 101). In this so-called ‘digital culture,’ a close relationship between the development of new technologies and citizens’ capabilities to improve their lives and achieve desired outcomes has been taken for granted.

Since the Internet was made publicly available in 1991, it promised to permeate most social life domains, both locally and globally, in a generic and customised way (Castells, 2000, 2005, 2014). From social media, such as Facebook or Twitter, to online banking, learning platforms, job portals, or government services like Universal Credit, it is hard to imagine any aspects of urban life that have not been digitised. As a result, the traditional physical and temporal models through which the world had been perceived have become blurred under new formats to experience reality. The Internet has undoubtedly created innumerable opportunities to access information with little spatial or temporal constraints with the potential to reduce inequality between citizens (e.g., by providing traditionally disadvantaged citizens with better access to jobs, education, or communication resources). At the same time, however, accumulating evidence suggests that the opportunities provided by the Internet are far from equal for everyone, and there is a significant risk that such digital inequalities can reproduce or even amplify traditional forms of inequality.
This phenomenon initially referred as the *Digital Divide*, described the uneven distribution or gap in the access to digital technological infrastructures and in the reasons for this gap. More contemporary research has open up this discussion to distinguish between complex set of divides that varied across different social, economic, and geographic context. For example, van Deursen & Helsper, 2015 have recognised at least three different levels of the digital divide. The first level refers to individual access to the ICTs and infrastructure (van Dijk, 2005). For example, while many people nowadays have virtually unlimited access to the Internet through their personal computers and their mobile phones, others rely on connections provided by public or semi-public places. Yet, others may not be able to connect to the Internet at all.

Structural access divides have become smaller over time due to increased network penetration and reduced costs of ICTs. Still, they remain an important source of inequality, particularly in remote and economically disadvantaged areas. The second level relates to the skills necessary to use ICTs and the activities people can perform online (DiMaggio et al., 2004, van Dijk, 2005). Many people own a computer but do not possess the skills to use it effectively to achieve desired outcomes. In this regard, research has focused primarily on operational skills that allow people to use particular devices and software, but information navigation skills, critical evaluation skills and communicative/social skills are similarly relevant.

Lastly, the third level of the digital divide refers to the unequal outcomes that users with similar profiles receive from using technology, such that different levels of social status can determine the extent to which online activities will lead to desired outcomes offline (Stern et al., 2009, van
Deursen et al., 2014). For example, the financial benefits incurred by advertising a service or product online may depend on the availability of social networks that can share and like advertisements on social media or on the financial resources needed to show advertisements during maximal user activity. Altogether, the consequences of the digital divides are self-evident. While the world is becoming increasingly digitised, a part of the population is at constant risk of being left behind and unable to use digital services to their advantage. Counteracting these adverse effects of new technologies requires systematic research to understand the mechanisms underpinning different forms of the digital divide and to identify targets for interventions that may reduce digital inequality.

The following sections will overview different theoretical frameworks developed to understand different aspects of the digital divides and discuss their respective strengths and weaknesses. Subsequently, recent studies examining the digital divides in rural settlements particularly affected by technological exclusion will be reviewed. The final section will discuss the importance of considering spaces outside people’s homes and work environments and outline the potential role of public and semi-public gathering places as potential technology enablers.
2.2 THEORIES OF THE DIGITAL DIVIDE

The following subsections introduce the different theoretical frameworks developed to explain inequality in access and use of digital technologies.

2.2.1 Internet Access as a Diffusion Problem

For almost 30 years, national and international agencies (i.e., the NTIA, UNDP, WB, the European Commission and the ITU) and scholars from disciplines such as sociology, economy and media studies have raised the alarms on the worldwide crisis that the information revolution could cause if left unattended. Just as the exclusion from jobs, shelter, food, health care and drinkable water, being cut off from basic telecommunications services has been seen by many as a new form of social exclusion. The term goes beyond the economic status of a person. It describes the inability to engage in normal relationships and activities available to the majority of society, with a direct effect on the individual’s quality of life (Park, 2012). Disengagement, service exclusion and economic exclusion are the main areas of social exclusion (Healey, 2011: 10).

The Clinton administration in the USA directed the National Telecommunication and Information Agency (NTIA) to examine ICT and Internet adoption, leading to a series of reports titled “Falling through the Net.” The first of these reports (NTIA, 1995), recognised the systematic gaps in the use of computer networks by socioeconomic status, educational background, race, gender, and geographic location in the country. From 1999 onward, NTIA reports explicitly used the term digital divide to document the gradual narrowing of systemic technological gaps (NTIA, 1999). However, as Internet penetration
increased in the USA, the discussion shifted toward the broadband divide or the implications of the aforementioned sociodemographic disparities around the availability and use of faster Internet connections.

Concerns about the disparities in technology access caused by personal variables, such as socioeconomic status, education, and geography, were also shared on a larger scale regarding the inequalities between developing and developed countries. A series of global efforts were initiated to increase ICT access and its use in the developing world. For example, based on a concern that the rapid growth of Internet use in high-income economies would raise the digital divide and marginalise developing countries, the World Bank launched in 1996 the InfoDev program to help finance small-scale projects designed to implement ICTs, as part of broader development efforts. However, Thompson (2004) criticised the technocratic vision of the World Bank as revealing a ‘technologic optimism bordering on determinism’.

In 2000, the United Nations proposed the Millennium Development Goals (MDG), trying to make available ‘the benefits of new technologies—especially information and communications technologies’ to the vast majority of the population. The MDG focused on a development model based on technology transfer as the central strategy and appealed to the importance of increasing the amount of technological infrastructure available to accelerate and multiply the effects of development interventions and outcomes inherent in the MDGs.

Following the global concern about the new technological disparity, in 2001, the OECD defined the ‘digital divide’ as ‘the gap between individuals, households, businesses and geographic areas at different
socio-economic levels with regard both to their opportunities to access information and communication technologies (ICT) and to their use of the Internet for a wide variety of activities'.

Despite the good intentions, the discourses above of national and international organisations surrounding the development of ICTs and the digital divide could be quickly criticised as being founded upon views of technological optimism and technological determinism, whereby technology was seen as the tool for ‘progress’ wherever it was installed. In this sense, these approaches assumed that the technological gap expressed the division between those who had access to ICTs, such as computers and the Internet, and those who did not (Selwyn, 2004).

These assumptions were challenged on the one hand by authors such as Webster (1995) and Feenberg (1996), who raised their voices to criticise as naïve the idealism surrounding the development and massification of technology as a tool to facilitate a positive social revolution. Webster warned about the need to recognise the contributions of sociological theories to address the social and ethical issues that would arise during technological development. On the other hand, authors like Mackay and Gillespie (1992) and Mackay et al. (2005) would criticise technological determinism as a limited belief that oversimplifies the complex relations between technology and society but without considering factors such as the ideology shaping technologies, the marketing of technologies that encourages and increases their demand, the processes of technology appropriation by the users and even the meaning that technologies acquire for the users, which undoubtedly influence the development and adoption of technology. Furthermore, neither technological optimism nor technological determinism would acknowledge the role of politics,
policies, and power relations in how technology shapes and is shaped by society.

However, this distinction of the digital divide, based entirely on structural access, was reinforced by different commercial and government reports and academic research, which indicated that, despite the increase in the overall penetration rates of ICTs, the distribution of Internet use was systematically uneven. The common point of these studies was that they measured the digital divide exclusively in terms of the penetration of personal computers and Internet connections in correlation with demographic indicators. For instance, Hayward (1995) and Norris (1999; 2001) suggested that bridging the digital divide between rich and poor by extending technological access would allow the integration of developing nations into a global economy, benefiting more impoverished and isolated communities all around the world with the flow of essential information.

To this end, Norris (1999) suggested exploring the reasons for inequalities in Internet access, reflecting on the impact of cross-national differences on the basic economic divisions between rich and poor societies, to predict the uptake of info-tech from standard economic indicators like the level of per capita Gross Domestic Product (GDP) and investment. For Norris (1999), the inequality in (Internet) access was not necessarily related to having particular skills. Instead, she proposed that differentiated access could be explained by the ‘endemic problems in poorer societies such as the general lack of affluence, leisure and education’. Therefore, long-term solutions on a larger scale should focus on providing development aid to boost economic growth. From a similar perspective, and seeking to explain the unequal distribution of Internet
hosts within post-industrial societies, Hargittai (1999) concluded that the financial wealth of a country, measured by per capita gross national product (GNP), was one of the most important predictors of the level of Internet access.

In reviewing those initial statements, the notion of the digital divide seems to have acquired different meanings, depending on the audience and the context in which it is analysed (Epstein et al., 2011). However, as the next sections will detail, this view neglects numerous individual and contextual variables that contribute to inequality in Internet use. Therefore, closing physical access gaps should only be considered a first step toward tackling the digital divide, not a solution.

So far, it has been argued that a significant tendency in the analytical approaches concerning the digital divide focused on the idea of a disparity in access to ICTs. As a downside, these approaches ‘obscured’ the variety of ideas about the complex nature of the problem itself (Epstein et al., 2011) and the different means required to solve it beyond setting the technological infrastructure. This unilateral model of social organisation, based on the ‘Western’ vision of progress, was insufficient to explain the different growing disparities in access to technology and its use. Most of these frameworks emerged during the first decade after the massive spread of the Internet, proposing to ‘tackle’ the digital divide exclusively in terms of a disparity in physical access (Norris 2001; Reddick et al., 2000), based on the simplistic assumption that ITCs would generate a radical change in the status and structures of knowledge access influencing all cultures and identities positively (Wolton, 1999; Epstein et al., 2011).
Fortunately, the concept of the digital divide has kept evolving. In the last decades, sociologists, economists and media scientists alike have widened their initial observations to account for the complex patterns of emerging socio-technical gaps. The following section will expand on these approaches and discuss their strengths and limitations.

2.2.2 A multi-layered framework for the digital divide

Several scholars studying the digital divide have emphasised that the dichotomy mentioned above between the haves and have-nots is simplistic and lacks sociological sophistication (Wolton, 1999; Webster, 1995; Selwyn, 2004). It is based on the idea that the gap will be closed as soon as the governments provide access to technology (Selwyn, 2004). However, ample research has shown that this is not usually the case. For example, government efforts to promote Internet access in rural areas - such as the Broadband adoption programme in the USA - have proved inefficient, leading only to a modest increase in Internet use (LaRose et al., 2011). It has been argued that an appropriate analysis of the digital divide that is capable of generating sustainable solutions requires consideration of individual skills and motives to use the Internet and of the role of societal and cultural contexts (Selwyn 2004; van Dijk and Hacker 2003; van Dijk, 2006; Hargittai 2002). Given that the digital divide combines questions of access and use of technology with the impact and consequences of engagement with ICTs for individuals, it is necessary also to question any policy strategy aiming to tackle this divide by pure means of increasing physical access and economic affordability to the Internet (Epstein et al., 2011).
One of the first authors who questioned digital permanence beyond mere physical access was Jan van Dijk, who proposed an integrative approach (Figure 2) that outlined the mechanisms through which different technological and individual variables affect Internet skills and type of technology use. He analysed the state of digital inequality through an accessible framework based on empirical research, exploring the motivations and challenges of seeking access and the development of requisite digital skills.

For Van Dijk (2002, 2003, 2005), the idea of ‘digital skill’ and ‘media use’ emphasised that media access should be seen as a process with many social, psychological and technological components captured by the single event of obtaining a particular technology. Figure 1 presents the initial framework proposal, which has become even more complex in
recent years. The framework incorporates personal and positional online and offline resources in order to understand the extent to which people will engage with digital technologies and theorise about mechanisms that underpin the digital divide (motivational, material, skills, usage):

Motivational access refers to an individual’s aspiration of having a computer connected to the Internet. This concept goes beyond the ‘have-nots’ by including the ‘want-nots’ and emphasises that not every non-user of the Internet should be considered digitally excluded as there are people who actively decide not to get connected even if they could. Research on non-users and unconnected citizens was relatively scarce around the globe when this framework was developed. A notable exception was the Pew Internet and American Life Survey (Lenhart et al., 2003). This pioneering study revealed that the Internet population was ever shifting and moving among intermittent users (those who stated going offline for extended periods); dropouts (those who lost connection to the Internet); and finally, the net evaders (those who refuse to use the Internet irrespective of their resources).

The central point to note about the idea of an ever-shifting Internet population, suggested by van Dijk (2006), is that by having a computer, or an Internet connection, it should not be assumed that someone is an ICT user. Therefore, when measuring computer and Internet access in survey questions, the possession or reference to the physical infrastructure should not be equated with its use. According to this author, different factors can be used to explain motivational access (e.g., computer anxiety or perceived usefulness of technology), which cover social, cultural, mental and psychological aspects of human nature. Therefore, large-scale surveys should be able to collect these different
pieces of information allowing to classify the different personality dimensions related to computer use.

*Materiel access* has mainly focused on the distribution of physical access to ICTs among demographic categories (e.g., income, education, age, sex, and ethnicity), showing the persistence of a divide between rich and poor. This physical access divide approach presents some complex problems when considering the adoption of ICTs, such as those observed by Norris (2001), between the normalisation and the stratification model of diffusion: The *normalisation model* presupposes that access differences between groups of different status only increase in the early stages of adoption and disappear with saturation in later stages. By contrast, the *stratification model* assumes that there is a different point of departure of the access curve for the higher and the lower social strata and a different point of arrival, where some strata will never reach levels of 90-100%.

The most crucial ‘background’ characteristics that seem to determine the physical access divide could be grouped within the variables of income, followed by age, education and occupation. Thus, inequalities based on economic, social, and cultural resources affect access to ICTs. Going beyond individual socio-demographic characteristics, van Dijk (2005) suggested a broader approach that combines the resource base of individuals with their social position in society. Within this context, Amartya Sen (1997) pointed out that inequalities of any type share heterogeneous magnitudes and delimit the extent to which individuals can participate in the most relevant fields of society (e.g., economy, politics, culture, etc.). According to Sen (1997, 2000), it is not just a matter of having certain resources or goods (in this case access to technology),
but about having the ability, or “capability”, to use those resources to achieve valuable “functionings”. In Sen's capability approach, capabilities or “real opportunities” are determined by a combination of personal characteristics, such as physical and mental abilities, and social factors, such as income, education, and access to services and affect peoples chances to pursue the lives they value. In this sense, the digital divide influences and is influenced by those realms. Along the same lines, Dutta-Bergman (2005) distinguished between two levels of access to ICTs: a micro-level that taps into individual access to computers and the Internet, and a macro level access that taps into (easy) community public Internet access through public venues, such as public libraries and schools, which is related to participation in this community.

Skills Access refers to the process of learning how to manage hardware and software for ICT use. It is related to the concept of computer and information literacy and information capital (Steyaert, 2002; van Dijk, 2002, 2003, 2005). At the most basic level, there are operational skills (van Deursen & van Dijk, 2009a; 2009b; 2010; 2011) that are the capacities needed to work with hardware and software. According to Steyaert (2002), these can be subdivided into information skills and strategic skills. Information skills are those applied to search, select and process information in computer and network sources. Formal information skills allow working with the formal characteristics of computers and the Internet, while strong information skills are required to find, select, process and evaluate information in specific sources, following specific questions. Strategic skills, refer to the multiple abilities required to use computer and network sources as a mechanism to attain particular goals and for the general purpose of improving one’s position in society.
A general problem that should be considered when evaluating an individual’s ICT skills is the questionable accuracy of self-report as a valid measurement. Van Dijk (2005) expressed a cautionary note on every investigation gathering information on ICT skills, as the divides of skills access are more significant than the divides of physical access, and while physical access gaps are continuing to close in developed countries, skills gaps tend to grow.

The social context and social networking of computer and Internet users seem to be decisive factors in the chances they have of learning digital skills (van Dijk, 2005).

Usage Access, the final stage of the process of technological appropriation can be measured in relation to at least four factors: 1) usage time; 2) usage applications and diversity; 3) type of broadband, 4) active or creative use (Van Dijk, 2006). A central problem when measuring usage time concerns the reliability of the information reported. According to Van Dijk (2006), the most accurate information should be measured in detailed daily time diary studies. Regarding usage applications, social categories such as class, education, age, gender and ethnicity appear to influence a user’s preference over the different applications available (Cho et al., 2003). Van Dijk (2005) observed the first signs of differential use of applications in daily practice and their relation to social position, income and education. He distinguished those with a higher social position as users of advanced computer and Internet applications for information, communication, work, business, or education, whereas people with a lower social position would perform more straightforward tasks accessing information, communicating, doing shopping or using it for entertainment. The type of broadband also
presents a strong influence on usage time and type of applications. People with a faster Internet connection tend to use more applications for a longer time (Horrigan & Rainie, 2002). Finally, the active or creative use of the Internet refers to the publication and maintenance of a personal website, blog, or publication on a bulletin board or community and is still a rare phenomenon. Generally speaking, ‘all familiar social and cultural differences in society are reflected in computer and Internet use’ (van Dijk, 2006).

Under this scenario, digital inequality does not end after physical access has been attained but starts when digital media are incorporated into daily life. Because of its high level of complexity, the multi-layered framework proposed by van Dijk has served as a steppingstone for explaining the different causes and effects of technology access and use as processes of appropriation. However, the high complexity of such an integrative framework can also prove to be a weakness when trying to apply it to inform area-based policies that rely on understanding the directionality of the phenomena circumscribed into a specific location. Another shortcoming of some versions of this framework (Van Deursen & Van Dijk, 2009a, 2009b, 2010) is that it imposes a set of putatively important digital skills in a top-down manner (i.e., the researchers alone decide which skills they deem most relevant). This normative approach neglects that acquiring digital skills is not the end goal but rather a means toward an end (i.e., digital skills allow people to achieve desired offline outcomes). Hence, instead of focusing on a narrow set of supposedly universal skills, more emphasis needed to be directed toward understanding how different skills relate to real-world outcomes and why these links might differ between individuals.
It must be acknowledged that van Dijk's latest work (2020) represents a significant development of his digital divide theory. By providing a more comprehensive framework for understanding the complex social, economic, and political dynamics that underlie the divide, his book ‘The Digital Divide’, delivered a more detailed focus on the notion of social exclusion than in his previous work, emphasising how the Internet could contribute to or alleviate this form of exclusion. While previously, Van Dijk's framework already included multiple dimensions for understanding the digital divide, such as access, skills, usage, and outcomes, it was not until his latest work, that he argued how all these dimensions are interconnected. Therefore, any interventions to reduce the digital divide must address all of them to reduce social exclusion.

2.2.3 The Bourdieusian approach: Offline Internet outcomes

Another approach to the digital divide has been inspired by the influential work of Pierre Bourdieu (1972, 1980; 1984) who advocated for a less individual-focused and more relational approach to sociology, and whose concepts of field, capital and habitus have become central to the analysis of inequality and stratification in the social sciences. Bourdieu (1972), would define the field as the ‘configuration of objective relations between positions. These positions would be defined in their existence and in the determinations that they impose on their occupants, agents, or institutions, by their current and potential situation (situs) in the structure of the distribution of different types of power (or capital), whose disposition commands access to specific benefits that are at stake in the field’. In other words, the field would refer to the social space within which individuals or groups interact and compete for resources and social
distinction. The field, would be structured by the distribution of various forms of resources, which Bourdieu (1972, 1980; 1984) would call capitals, and these capitals could be utilised by individuals or groups to gain social, economic, and cultural advantage among others, which would determine their relative chances of success.

Bourdieu would argue that these forms of capital are not independent but rather they are interconnected and are mutually reinforcing. For example, a person with a high level of cultural capital would use their knowledge and education to access opportunities and resources that would otherwise be unavailable to them. Similarly, social capital could help a person to acquire economic capital and vice versa. This would explain how social inequality is created and reproduced over time, as people with more capital have more opportunities and resources than those with less capital.

Bourdieu further assumed that over time, individuals would develop an internalisation of their position within a field (the so-called habitus), which would have a direct effect on their attitudes, perceptions, and actions and would reinforce the status differences between individuals contributing to the reproduction of social inequalities.

The relevance of Bourdieu’s work for the analysis of the digital divide relies on allowing to suggest that people’s predispositions by things such as their differentiated cultural and social backgrounds could influence their capacity to engage with technology and the Internet. Laura Robinson recovered this approach to the digital divide by characterising how economic differences in life context can shape individuals’ orientation toward ICTs, determining their subsequent attitudes and skills. Taking a holistic approach that situates Internet use within an
individual’s general life context, Robinson focuses on different styles in which people interact with the Internet, based on their assessment of associated costs and benefits. In a seminal paper, Robinson reported data from surveys and interviews of teenagers in California (Robinson, 2009). The author criticises the way empirical studies have often examined samples of participants who use the Internet ‘at least occasionally’ (e.g., Lenhart et al., 2008) and often have generalised the results as if these criteria would constitute a homogenous group. Robinson argues that by assuming such approach, significant differences tend to be overlooked in the quality of access between different users and the dramatic consequences that these access gaps can have on people’s orientation toward ICTs. For instance, some of her participants had access to their own PC with a high-quality Internet connection at home, whereas others had to travel to the public library, where they were only allowed to use computers for limited time slots and with often poor levels of connectivity and a lack of privacy. Subjectively, such spatial and temporal constraints on Internet access were associated with opportunity costs (e.g., waiting in line at the public library would prevent them from engaging in other valued activities) as well as emotional costs (e.g., time pressure to finish homework within limited time slots or embarrassment for having to ask friends to use their internet connection).

Importantly, Robinson postulates that the experience of these costs can have very negative consequences on people’s attitudes toward the Internet and their ability to develop more sophisticated digital skills. At the time of the study, teenagers from disadvantaged families often reported perceiving the Internet as a ‘dispensable luxury’ that is useless for tasks that promise clear and immediate positive outcomes. As a consequence, they develop a ‘taste for the necessary’, a purely task-
oriented way of engaging with the Internet that is sufficient to address specific life issues (e.g., doing online shopping) but prevents them from forming positive attitudes or gaining any deeper transferrable digital skills. By contrast, for their peers from more advantaged family backgrounds, Internet use was not associated with the same opportunity and emotional costs. As a consequence, they typically considered Internet use as leisure and engaged with ICTs in a much more playful and exploratory manner, enabling them not only to solve specific tasks but also to develop a rich set of digital skills.

In summary, Robinson postulates that differences in Internet access interact with differences in Internet orientation to form a feedback loop that can have profound effects on attitudes, skills, and experiences and can therefore amplify pre-existing social inequalities. This theoretical link between life context and orientation in information seeking provided a fresh perspective on the digital divide that underscored the need to consider Internet use within an individual’s life context; and called into question the common approach of treating Internet users as a homogenous group. That being said, it should be noted that Robinson’s theory tends to be particularly normative and assumes that certain digital activities are (un-)desirable for everyone, which neglects that for some individuals even seemingly shallow Internet activities (e.g., gaming) can become very meaningful and lead to highly desirable outcomes (e.g., if they are a central source of social interaction for an individual).

2.2.4 The role of location in the digital divides

Within the theories of digital divides that have expanded the scope of inquiry beyond access to digital technologies, some theories have
focused on the requirements to develop digital skills, digital literacy, and the affordability of digital technologies. Another line of research approaching the problem has come from analysing the “geographic” or “spatial” factors playing a role on the digital divides. This line of research has highlighted the importance of considering geographic space and the infrastructure within it in the efforts to reduce digital exclusion. Its supporters have aimed to inform policy and practice bridging the digital divides in different regions and countries.

Authors from this approach have expanded on how the area, rural or remote, and its characteristics can limit the availability and capabilities related to technology and internet infrastructure access and use. As such, Mark Graham has argued that spatial inequalities in access to digital technologies and knowledge have underpinned broader social and economic disparities. He has noted that individuals and communities with better access to digital technologies present advantages in the knowledge economy (2015), and in their capacity to participate further in society (Graham et al., 2011; Graham et al., 2015). Overall, Graham’s work sheds light on the ways digital technologies exacerbate existing social inequalities in different regions.

In a similar way, Steve Graham and Simon Marvin (2001) warned about the existence of digital enclosures, referring to the ways in which access to digital technologies was unevenly distributed across different regions and neighbourhoods (though, their work reflected on urban areas). According to Graham (2003), digital enclosures and network ghettos, understood as places of low telecommunications access and concentrated social disadvantage, were exacerbating existing patterns of spatial inequality. Therefore, any efforts to reduce the digital divide
should focus on promoting more equitable and democratic access to digital spaces and infrastructure. In general, these authors highlight the importance of factoring space and location to understand the uneven distribution of digital resources.

In a similar way L. Marcus and D. Koch (2017) recovered the importance of the location and the concept of capital to define spatial capital as the physical and social infrastructure that supports urban life and economic activity. In their view, spatial capital is a critical component of a smart city systems as it determines the quality of life and economic opportunities available to its residents.

According to Marcus and Koch, spatial capital includes both physical infrastructure such as buildings, roads, bridges, and public transportation systems, as well as social infrastructure such as schools, hospitals, parks, and community centers. They suggest that the quality and connectivity of this infrastructure can have a profound impact on the success of smart city initiatives, as it can determine the accessibility, safety, and efficiency of city systems.

Furthermore, Marcus and Koch argue that a spatial morphology, or the physical layout and design of the city, is an important aspect of spatial capital. They contend that the way in which urban spaces are organized and designed can have a significant impact on the social, economic, and environmental sustainability of the city. Therefore, they emphasize the importance of considering spatial morphology when designing and implementing smart city systems.

De Holanda has also recovered Bourdieu's theory of capital to provide a useful framework for analysing the role of space in social and economic
processes. De Holanda argues that spatial capital is a form of cultural capital based on the value and attractiveness of physical space. In this sense, spatial capital can include the physical characteristics of a location, such as its architecture, design, and natural environment, as well as the social and cultural activities that take place within that space.

De Holanda suggested that spatial capital could have a significant impact on economic and social outcomes. For example, cities with attractive and well-designed public spaces would be more attractive to businesses and tourists, leading to greater economic growth. Similarly, spaces that facilitate social interaction and cultural exchange could help to foster a sense of community and social cohesion. By recognising the value of spatial capital and investing in the design and management of physical spaces, communities can create more vibrant, sustainable, and equitable environments.

By understanding the ways in which geography and access to technology intersect, policymakers and researchers can develop more effective strategies to bridge the digital divide and ensure that people have the opportunity to benefit from the knowledge economy in a more evenly way.

2.2.5 Beyond access and demographics: The Weberian approach

A related perspective has been proposed by Massimo Ragnedda (2017) who developed a sociological approach that focuses on stratification and inequalities in the digital world. This approach is inspired by Max Weber’s multidimensional theory of stratification that conceives inequality not merely as a matter of material possessions, but rather as the interplay
between different types of resources such as a person’s wealth, prestige, status, or power. Collectively, these resources are thought to determine an individual’s ‘life chances’, i.e., their ability to achieve desired outcomes and satisfy one’s needs.

Ragnedda hypothesises that social stratification, as conceived by Weber, is reproduced online. To this end, he applies Weber’s concept of capital that define a ‘set of actually usable resources and powers’ (Bourdieu, 1984) that play a vital role in producing and reproducing profits in individuals’ life opportunities (Bourdieu, 1983). Capital thus reflects the combination of a person’s internal abilities and their external resources within a particular field of life. Several forms of capital can be distinguished: social capital reflects a person’s present and potential resources that result from relationships with other people. Political capital reflects a person’s powers that result from participation in interactive political processes. Economic capital reflects material resources that could be used to obtain or preserve better life chances. Cultural capital reflects skills, education, and knowledge which serves as currency to obtain other resources. A key feature of each type of capital is that they can be accumulated, transformed, and reinvested. Ragnedda proposes that the digital world constitutes an additional field of life and therefore refers to resources related to Internet use as digital capital (Figure 3). A person’s digital capital reflects their accumulated level of digital competencies as well as their available technological resources. The level of digital capital determines the quality of Internet experience, which can, in turn, be converted into other forms of resources. As such, it provides a bridge between online and offline life chances, whereby the benefits of Internet use depend on the interaction between online activities and other forms of capital.
Note: According to Ragnedda’s proposal, social, cultural and economic capitals contribute towards generating digital capital, influencing the number and types of online activities and producing in return effects on social/cultural/economic capitals as well.

The best scenario arises when levels of both digital and other forms of capitals are high. In this case, people have a better Internet experience and are more effective at using online activities to produce concrete and valuable offline outcomes that enhance resources in other fields, e.g., by using the Internet as a means to organise political protest (political capital), establish or link social networks (social capital), look for new job opportunities (economic capital), or access new information (cultural capital). This smooth transformation of online activities into offline outcomes allows advantaged individuals to further reinforce their privileges in society. An intermediate scenario arises when either the level of digital or non-digital forms of capital are low. In these cases, people can accrue and use resources within particular fields, but there is only limited opportunity for interactions between fields. For example, a successful businessperson with little interest in the Internet would miss out on the chance to further enhance their resources through online
activities. Conversely, a disadvantaged person may struggle to bring their online skills to bear on other aspects of life, if they are lacking education, social class, and relevant social connections. Finally, the worst-case scenario arises when the level of both digital and non-digital forms of capital are low. In this case, the disadvantaged position of an individual is further reinforced due to their exclusion from the online world, which has concrete deleterious outcomes in the offline world, e.g., in their access to health care, job markets or academic resources.

In summary, the core assumption of Ragnedda’s theory is that the digital divide is not merely a reflection of economic class differences, but instead results from complex interactions between different forms of resources that constrain a person’s life chances. This approach provides a theoretical perspective on what Ellen Helsper has called the “third level digital divide” (see next section): the phenomenon that some people will benefit more from the same online activities than others. It can also explain why certain groups of people (e.g., middle class vs. working class or young vs. old people) differ in their engagement with digital technologies (van Dijk, 2020).

That being said, a problem of the theory is that its core concepts, the different forms of capital, are very broad and therefore difficult to operationalise. Likewise, the theory has few constraints in terms of how different forms of capital can interact. Both of these aspects complicate the derivation of concrete and falsifiable predictions and therefore limit the utility of Ragnedda’s theory for empirical work. The novelty of the theory has also been questioned, as it relies heavily upon concepts from other scholars, such as van Dijk.
Moreover, Ragnedda’s conception of digital capital being separate from other forms of capital has been critiqued, as the proposed indices of digital capital (e.g., high-quality Internet connections or high levels of digital skills) could easily be conceived as resulting from differential levels of other capitals (e.g., differential economic resources or socialisation in a more or less technology savvy environments).

2.2.6 Towards a corresponding field’s model

Ellen Helsper has proposed the *corresponding fields model* (Figure 4) that combines sociological with psychological ideas into an integrative account of the third-level digital divide. Similar to the Weberian idea of different forms of capitals, the model distinguishes between multiple spheres of influence in a person’s offline and online everyday life – the so-called ‘fields’.
Within the model, each field consists of a variety of resources that can be measured in terms of different indicators. The economic field refers to a person’s income, education, employment, and access to financial services. As such, it reflects the economic resources available to participate in financial, commercial, and educational activities. The cultural field refers to specific socio-cultural groups that a person belongs to (e.g., their ethnicity, religion, gender) and that share a certain type of socialisation or acculturation. Through norms and socialisation, such cultural resources shape a person’s identity and perception and valuation of the world and can place severe constraints on the way in which a person may be able to take control of their life (Room, 1999). The social
field refers to the embedding of a person into social networks that provide access to knowledge and support. Finally, the personal field reflects the collection of an individual’s abilities to take advantage of new opportunities, irrespective of their economic, cultural, or social resources. This involves a large set of indicators, such as a person’s skills, personality, or health, that determine the extent to which they are equipped to meet the demands of their everyday life.

Importantly, the corresponding fields model makes more specific assumptions than other frameworks about the way digital and non-digital resources influence each other. Interactions between digital and non-digital resources are thought to be strongest within corresponding fields. Furthermore, the model postulates that the influence of offline activities on the level of digital inclusion in the corresponding digital field depends on several social impact mediators. These mediators refer to a person’s level of Internet access, as well as their relevant skills, motivations and attitudes. These variables are reminiscent of the different levels of Internet access in previous frameworks (e.g., van Dijk, 2005). However, while other frameworks have treated these variables as indicators of digital exclusion, the corresponding fields model assumes that they determine the impact of offline resources on the level of digital inclusion. The model further proposes that the influence of online activities on the level of inclusion in the corresponding offline field depends on several digital impact mediators. These mediators were identified based on previous research (e.g., Heeks, 2010; Taylor & Todd, 1995) and refer to the relevance or usefulness of online activities, the quality of the online experience, the sense of ownership, and the (social and financial) sustainability of engagement with different digital resources.
The corresponding fields model provides a detailed and integrative approach for the study of the causes and consequences of digital inequality. A clear advantage of the model is that it specifies how different forms of digital and non-digital resources should be measured and that it makes clear predictions about how they should be related. Providing a framework that permits to derive specific and falsifiable hypotheses constitutes an important step forward, pushing theories of the digital divide to become more analytic and less descriptive. At the same time, it should be noted that the corresponding fields model is still under development and has so far received only partial empirical support. For example, large-scale survey data have established only some specific links between corresponding fields, alongside other links between non-corresponding fields (Helsper & Eynon, 2013). At the current stage, it is unclear to what extent this reflects difficulties in the operationalisation of the respective indicators or a lack of independence between the different fields. Similarly, more research will be necessary to identify the most critical digital impact mediators to establish which variables determine the value of digital engagement in people's everyday life.

2.2.7 Ecological approaches to digital inequalities

A problem that has become evident in more recent years on the analysis of the digital divides, has to do with the adoption of either a macro-perspective, searching for the causes of digital inequalities at the level of societal structures or a micro-perspective, which focuses on identify individual person variables. These views have largely neglected a meso scale analysis on how social groups and networks shape people's
identities and daily lives affecting their interaction with digital
technologies

Recently, different scholars have begun to fill this gap by drawing
inspiration from socialisation theories and focusing on how people
develop their views of themselves and the world they inhabit (e.g.,
Helsper, 2021, Kral, 2014; Mossberger, Tolbert, & Lacombe, 2021). Such
approaches are referred ‘ecological’, based on a term coined by
Bronfenbrenner (1979), who emphasised the importance of relationships
and social context in explaining human behaviour.

Within the ecological theories, the concept of inequality becomes more
intricate, as it is deeply grounded in people’s internalised beliefs about
the structure of the world and their own role within it (Smith & Pettigrew,
2015). This perspective can explain how inequality can often be self-
perpetuating and it emphasises that change is a social phenomenon that
requires a shared awareness that existing inequalities are relevant and
unjust (Helsper, 2021).

In the context of the research on digital inequalities, the ecological
perspectives shift the focus from establishing correlations between
structural and/or person variables and with digital technologies
engagement towards understanding how the perception and use of
communication technologies are shaped by the social interactions in the
different environments a person inhabits. The latter questions are rather
challenging to answer but doing so promises to yield important analytic
insights into the conditions under which change in technology
engagement can emerge.
In summary, the different theories of the digital divide have evolved considerably over time, focusing on different aspects. Early theories concentrated primarily on factors that determine whether or not an individual has structural access to digital technologies (first-level digital divide). However, with the more widespread diffusion of the Internet, research has transitioned away from questions about structural access and toward questions about the role of individual and socio-cultural factors that predict differential forms of engagement with digital technologies (second-level digital divide). Recent theories have also begun to incorporate the digital world into general frameworks of inequality and social stratification to explain why certain individuals benefit more from the same online activities than others (third-level digital divide). This work has highlighted the importance of integrative approaches that situate internet use within an individual’s life context and that elaborate on how a person’s resources in the digital field interact with other forms of socio-cultural resources. Despite extensive research, however, little consensus has been reached regarding how digital and non-digital forms of resources interact (at the theoretical level) and how these variables should be measured (at the empirical level).

2.3 DIGITAL DIVIDE IN RURAL AREAS

A general problem of research about the digital divide is that so far studies have primarily been based on large-scale surveys. This research has yielded very valuable insights about general Internet and technology usage patterns. Still, the focus on “Big Data” has neglected area-based differences, leaving some population sectors underrepresented. For example, within the UK, Ofcom (2016) publishes an annual report on developments in the communications sector, including an extended
Internet and online content section discussing Internet accessibility and use. This report also offers an overview of the profiles of people who do not use the Internet at all and their reasons for not having an Internet connection. Despite the value of this information, these reports are clearly limited, mainly because the presented information was captured solely by broadcasters, telecom operators, and third-party data (Ofcom, 2017). Hence, it is impossible to elaborate on a more detailed analysis below the Local Authority levels.

Another example is the Oxford Internet Survey (OxIS), an extensive survey of Internet use in the UK that was developed by the Oxford Internet Institute. The OxIS systematically investigates the changing patterns in the use of the Internet and the technological habits of a specific population over time and has many important strengths. For example, it has a robust research methodology approaching Internet penetrability in a large sample population. Based on face-to-face interviews also improves the reliability of the responses collected. It is flexible, offering a wide variety of answers to different research questions and consistent, tracking trends and changes across the years (the data have been collected bi-annually from 2003 to 2019). Despite all these qualities, however, the OxIS is only of little help in understanding potentially significant geographic inequalities related to Internet use at subnational levels (Blank et al., 2017). Being a national sample survey, the OxIS does not offer enough data on sub-national levels to conduct place-based analyses in small rural areas.

Another more recent set of relevant studies are based on the DiSTO (2023) (“From Digital Skills to Tangible Outcomes”) project that draws on rich data from many international study sites to improve theories and
methods in the realm of digital inequality. The DiSTO project aims to establish links between digital skills and outcomes with other forms of inequalities and has provided strong support for corresponding fields. The DiSTO model by documenting pervasive inequalities in the outcomes of digital activities, such as finding jobs or saving money. The DiSTO projects have also set new methodological standards by avoiding traditional measurement limitations (e.g., asking participants about specific platforms that may vary in popularity over time) or by distinguishing between different forms of digital skills. That all being said, the DiSTO projects also tend to focus on nationally representative samples, providing limited insights into the particularities of small rural areas.

Information regarding the geography of Internet expansion is inconsistent, and there are significant reasons to suspect that spatial differences may be relevant when understanding the reasons for using the Internet on smaller scales (Anderson, 2007; Longley and Singleton, 2009; Blank et al., 2017). As such, it should be pointed out that there are apparent local and regional inequalities in the access to and use of the Internet and the way infrastructure is distributed. Rural areas exhibit particular challenges such as their geographic isolation, a lack of economic resources, reduced access to public services, and un-balanced demographic characteristics of their population, due to the increasing out-migration of young people. Improving access to digital technologies has the potential to address some of these challenges, e.g., by enhancing access to services, improving communication channels, and providing new business opportunities for younger inhabitants. Consequently, there is a pressing need to better understand the adoption of digital technologies in rural areas. Unfortunately, however, these areas have rarely been considered in empirical studies.
To bridge this gap, researchers have recently begun to examine Internet use in more remote rural areas. One line of work has used large-scale data sets to correlate the spatial distributions of Internet use and economic deprivation. These studies have aimed to establish if the economic divide between urban and rural areas is also reflected in the digital domain. For instance, Anderson (2007) used stepwise models to estimate time spent online, producing spatial micro-simulations for specific country locations. Longley and Singleton (2009) recovered Anderson’s work by combining two nationwide data sources, the Index of Multiple Deprivation and the UCL e-society classification, to develop a geodemographic classification for organising areas into categories that shared similarities across multiple socioeconomic attributes. In doing so, they observed a general link between material deprivation and digital exclusion, whereby more deprived regions exhibit higher levels of digital exclusion. At the same time, there was also considerable variability between areas with similar levels of material deprivation, indicating the importance of additional variables.

Similarly, Philip et al. (2015, 2017) used data from Ofcom (2016) and EDINA Digimap Ordnance Survey Service to analyse the implications of digital exclusion for rural areas (particularly remote rural) and reviewed the policy context of broadband and mobile Internet infrastructure in Britain. The authors recognised the existence of territorial-based barriers that mediate a lack of digital connectivity and are typically overlooked at national levels. For example, the combination of low economic resources and poor Internet connectivity in an area can create a vicious circle, whereby it is simply not profitable for Internet providers to invest in better infrastructure. Philip et al. (2015, 2017) assert that current UK policies are insufficient to effectively address this digital exclusion of the ‘final few’,
warning that the general enhancement of ‘faster, fastest’ Internet connections in urban areas can leave rural areas behind, where people want to be online, but their local infrastructure cannot support high-quality connections. Despite the strong value of these studies in focussing on the access to digital technologies in rural areas, a clear limitation of this work is the combination of different data sources aggregated at the level of entire regions. Such correlations between spatially aggregated data provide only very approximate descriptive insights and preclude the analysis of direct links between deprivation and digital inclusion at a smaller spatial scale, which could lead to more specific insights on how to design effective area-based policies.

An alternative approach to investigate the digital divide in rural areas has been to conduct qualitative research within rural communities to understand the role of digital technologies in the everyday lives of local citizens and their reasons for engagement or disengagement. For example, Ashmore et al. (2015) conducted 36 interviews with two rural community-based superfast broadband organisations in the UK. This study presented important new insights, e.g., that the Internet was used as a tool to enhance resilience at an individual and community level, that this effect depended on the availability of superfast Internet, and that reasons for using or not using the Internet vary considerably depending on the individual life context. Along the same lines, Williams et al. (2016) conducted a pilot study in a rural disadvantaged area in the northern UK. The study was based on Internet Diffusion Theory (see section 2.2.1) and tested if providing citizens with free access to high-quality Internet connections will increase their interest in it and ultimately enhance the likelihood of them becoming regular users. To this end, Williams et al. (2016) followed seven households of local business owners across the
study area, which had recently received free access to high-speed Internet connections. In partial support of their hypothesis, it was found that some participants expressed a greater interest in continuing to use the Internet after having experienced a high-quality connection for an extended period of time. This aligns with the aforementioned findings by Philip et al. (2015, 2017) and suggests that the lack of high-quality Internet access provides a territorial-based barrier for the use of digital technologies in rural areas.

Outside the UK, Correa and Pavez (2016) conducted qualitative in-depth interviews with inhabitants of ten remote Chilean communities, where governmental programs had recently enhanced 3G Internet access. This study identified several important individual and contextual factors that facilitated and hindered Internet use in rural communities. For instance, it was found that people in remote areas often avoid new technologies because they fear new and uncertain situations and they exhibit low confidence in their ability to manage them. Young people can act as “technology socialisation agents” to overcome these fears, but they are lacking in many rural areas, reflecting a missing and important community resource. The study also found that the level of Internet engagement depended strongly on the area’s economic and occupational situation, whereby individuals with primary manual occupations would see little reason to engage with the Internet. This underscores that the mere availability of digital technologies is insufficient and that they will only be adopted if people perceive them to be useful in achieving desired outcomes.

Another study by Reisdorf et al. (2016) explored the attitudes and feelings of 20 middle-aged British and Swedish Internet non-users as well
as their reasons for being offline. Middle-aged people were studied because they are typically underrepresented in research on Internet use, they are still part of the workforce for a considerable amount of time, and they are likely to have children at home who might (need to) use the Internet. Consequently, their Internet non-use might be especially disadvantageous. The study found that reasons for staying offline varied greatly from a lack of interest or need to a general discomfort with the use of technologies to physical impairment that complicated their use (e.g., poor eyesight). Similarly, people’s feelings about their non-use of the Internet differed widely from being happy with it (when they perceived no need to use it) to feeling different from the majority or regretting not having learned how to engage with the Internet earlier. Interestingly, the study also looked at the role of social networks, observing that some of the participants stayed offline because it was more convenient for them to have other people (e.g., friends or family members) use the Internet for them. This emphasises that social contact may not always facilitate technology adoption, as in the study by Correa and Pavez (2016) outlined above, but that it can also promote patterns of dependence that hinder rather than promote active and exploratory Internet use.

In summary, research has only recently begun to examine the digital divide in rural areas. Spatial approaches have established important insights on the differences faced within the rural-urban divide to access reliable and fast ITCs and have linked Internet use with other forms of economic deprivation. However, their reliance on spatially aggregated data results in rather descriptive conclusions that are insufficient for understanding the local reasons for digital disengagement or for informing strategies to tackle locally the digital divide. Qualitative studies
have provided more direct insights about the role that digital technologies play in the everyday lives in rural areas and the potential barriers that hinder their appropriation. At the same time, it should be noted that most of these studies are based on very small sample sizes and their sampling procedure is typically far from random. Accordingly, these studies can only provide partial and exploratory insights that need to be tested by future research.

2.4 TECHNOLOGY USE IN PUBLIC AND SEMI-PUBLIC PLACES

Another important limitation of previous research on the digital divide, social interventions and policies seeking to promote technology use, is the predominant focus on ICT use in specific places, especially at home or at work. This common practice is likely due to the implicit assumption that access divides have largely been closed and to the predominant focus on economic and employment benefits of digital engagement. However, even nowadays, not everyone can access ICTs in these places (e.g., due to the lack of an Internet connection or due to lacking skills and/or confidence in technology use), emphasising the need to acknowledge and examine the role of social gathering places outside the home and work in shaping people’s access to digital technologies.

The central role of public and semi-public places has been broadly discussed by the urban sociologist Ray Oldenburg in his book “The great good place”, who suggested that ‘daily life, in order to be relaxed and fulfilling, must find its balance in three realms of experience. One is domestic, a second is gainful or productive, and the third is inclusively sociable, offering both the basis of community and the celebration of it’ (Oldenburg, 1991: 14). He called this last area third place, which refers to
the social arena ‘that hosts the regular, voluntary, informal, and happily anticipated gatherings of individuals beyond the realms of home and work’ (Oldenburg, 1991: 16). Third places refer to ordinary public or semi-public places like restaurants, bookstores, coffee shops or pubs. They do not need to be designed as social or commercial venues. Still, they need to be based on neutral ground, allowing their users equality by allowing lively conversation in a playful mood, and making them feel comfortable by finding in the third places a home away from home (Oldenburg, 2002).

From Oldenburg’s work, it can be inferred that third places exist as symbolic spatial arrangements, generated by their regular users who make them come alive; those who attend them at almost any time with assurances that acquaintances will be there. While for Oldenburg (1991; 2002), third places followed a more traditional shape, being mainly commercial areas that responded to the leisure needs of the American society at the end of the last century, authors like Mikunda (2004) appropriated the term to give a social sense to public and semi-public physical venues on more recent times. Mikunda (2004), considered an expert on experience economy, suggested a new type of third place: the spectacular places. People expecting to be entertained through staged experiences attend these particular arenas. These third places, suggested by the author, take place at cultural landmarks that sometimes are not visited for their content but for specific areas that are included within them. For example, on an interview, Mikunda exemplified with the Tate Modern and the Louvre what he calls the “spectacular” third places of our times. The author, suggested that these “cultural” semi-public arenas were visited not necessarily for their direct content (cultural or historic), but sometimes they were visited because of their shops, cafés
or inner landmarks such as the pyramid in the Louvre (Hirsch and Mikunda, 2001)

Mikunda compared the growing attraction generated by cultural and historic landmarks with supermarkets and shopping centres, as both work with the same methods: exploiting lights, sounds and video projections to exalt the sensorial experience of their visitors (Hirsch and Mikunda, 2001). These third places share the characteristic of being emotionally “comforting” by providing a mental massage to their visitors. Spectacular third places depend on a core attraction, ‘a central feature that is so spectacular that is seen as a must; it becomes the talk of the town’ (Hirsch and Mikunda, 2001). But both types of third places, the more commercial places suggested by Oldenburg (1991) and the spectacular ones suggested by Mikunda (2004), share the ability to create an emotionally charged ambience for their users and visitors, which makes them not just spatial but also symbolic landmarks within the city.

In the context of the digital divide, there are several reasons to believe that third places, like the ones described by Oldenburg and Mikunda, could also play a facilitating role as technology enablers, especially in remote rural areas. For example, rural areas often present constraints on structural interventions, thereby increasing the demand for accessing services in public places. In other words, some people may have to approach third places as hot spots simply because not everyone within the village can acquire an Internet connection at home or would even own the infrastructure such as a computer or a laptop to use it. Moreover, as noted above, rural areas are often inhabited disproportionately by elderly populations, for many of whom third places represent the primary source for social interaction. Hence, third places could potentially
provide a social space for non-users of the Internet to find information and support about the use of new technologies. Importantly, in remote and scattered areas, even places like post offices, convenience stores or gas stations have the potential of becoming important third places, as they are visited with high regularity providing services that are not available anywhere else nearby and promoting social contact among people who would otherwise not interact. So, even if these places do not offer Internet connections, they might foster communication exchange that can ultimately facilitate people’s access to the Internet.

The latter point illustrates that there are different ways by which social engagement in third places could facilitate technology use. Most evidently, third places can provide physical access to otherwise unavailable technology. In addition, meeting experienced and knowledgeable peers in third places may also reduce concerns about one’s own perceived lack of ICT-related skills. Furthermore, learning from others about available online services (e.g., accessing NHS services online instead of staying on the phone for hours) may also increase people’s interest and motivation to engage with ICTs in the first instance.

In summary, research aiming to close the digital divide has predominantly focused on the adoption of the Internet at home as a final connectedness goal. This approach can incur significant limitations in capturing the mechanisms that underlie technology use. This is particularly the case in remote rural areas, where places other than the home or the work environment, that said third places, can provide essential arenas for social gathering that can directly affect people’s level of access, motivations, and skills to use the ICTs. Consequently, the current study includes the
role of third places in shaping people’s access to the internet, as will be detailed in the next section.
Chapter 3. Understanding Internet access through a mixed-methods approach
3.1 INTRODUCTION

As outlined in the previous chapter, the central aim of this thesis was to understand the different factors contributing to inequalities in the access to and use of the Internet in rural neighbourhoods. Based on this motivation, this chapter outlines the tailoring of a mixed-methods approach developed to examine the individual and ecological integrative elements that contribute to the advantage and disadvantages of the inhabitants of a rural village in Cornwall at different complementary levels. The following sections describe the different research protocols developed and explain the specific research questions they were meant to answer, justifying the combination of research tools to generate an in-depth understanding of the different factors that shape access to and use of the Internet in the study site.

Overall, the study followed an exploratory mixed-methods design with two sequential phases that served different specific purposes and therefore employed different research methodologies:

**Phase 1** used a qualitative approach to initiate access to the study site and to explore the phenomenon of Internet connectivity from the perspective of those experiencing the enhancement of digital technology while trying to avoid addressing preconceptions from the researcher (Creswell et al., 2003). The initial goal was to earn inhabitants’ trust, motivating them to participate in the study. Subsequently, it also aimed to capture insights into the inhabitants’ patterns of everyday life and the role of ICTs therein. To this end, different participatory and co-creative tools were developed that enabled the exploration of the state-of-the-art of Internet connectivity in the area. They also incentivised the participation of the inhabitants’ to actively contribute to the research
development and convey the role of ICTs in their life with minimal intervention by the researcher’s preconceptions. This initial stage resulted instrumental not only in understanding Internet connectivity through the eyes of the inhabitants (co-designing the next steps of the research), but also for tailoring the research instruments required to assess Internet-related behaviours in the studied area (Creswell & Cizek, 1999; Creswell et al., 2004).

**Phase 2** then applied the customised instruments to infer the mechanisms that underpin digital inequality among the inhabitants of the rural neighbourhoods. As outlined in Chapter 2, the current research aimed to examine the access to and use of the Internet through the theories of the digital divide, which provide different levels of analysis (individual, structural, and socio-cultural) that allow gaining a deeper and more integrative understanding as to why there are digital inequalities even in a small rural area like Pendeen. Partaking in this approach called for a mixture of methodologies:

Initially, the role of person variables was examined to delineate the socio-demographic lines along which a digital inequality existed within the study site. To this end, an in-depth household survey was conducted to obtain detailed information about the inhabitants’ Internet behaviours, sociodemographic characteristics, and related attitudes and skills. The survey data were analysed with quantitative statistical techniques to develop profiles of Internet users and non-users and to characterise their Internet use and reasons for non-use, respectively. In addition, regression analyses were used to examine if the effects of different explanatory variables exhibit independent or interactive effects on Internet access and use, focusing on the role of social support as a potential
compensatory resource that can mitigate the negative effects of other person variables.

In a second step, the study examined the structural development of the study site as a former mining area and its current status as a historic conservation area, aiming to understand to what extent these characteristics of the area have shaped people’s access to new technologies such as the Internet nowadays (both at the level of access to infrastructure and the level of integration of technologies into the community’ patterns of everyday life). It also aimed to examine if public and semi-public places distributed throughout the study site could provide social arenas that could facilitate access to new technologies. To address these questions, a socioeconomic and historical document analysis of the neighbourhoods constituting the study site was conducted, in conjunction with careful observations of inhabitants’ routines, to gain an insight into the inhabitants’ daily lives in relation to their village and its amenities.

Lastly, the study aimed to enrich and contextualise the information gathered in the previous sections by connecting them to the unique experiences of individual inhabitants captured in parallel to the collection of household surveys. A qualitative analysis of the life circumstances was conducted to illustrate how structural, spatial, personal and socio-cultural conditions interact to determine whether or not inhabitants would engage with ICTs, what they were using the Internet for and how, what difficulties they encounter, and what resources they could use to overcome them.

To illustrate how the two study phases were interlinked, the remainder of this chapter is divided into three sections outlining the general research
design (section 3.2), the qualitative data sources used in phase 1 (section 3.3), and the different data sources and methodologies used in phase 2 (section 3.4).

3.2 THE RESEARCH DESIGN

During the last four decades, researchers from various disciplines have been interested in the use of mixed-methods techniques to expand the analytic scope of their studies (Greene & Caracelli, 1997a; Sandelowski, 1995; Swanson, 1992; Tashakkori & Teddlie, 1998). In the analysis of urban development and planning, the use of mixed methods has been guided by researchers’ commitment to inquire about situations in more holistic ways to accommodate the complex demands of contemporary urban settings and the societies that inhabit them.

Combining qualitative and quantitative approaches via a systematic, empirical and critical process (Patton, 1990; Sampieri, 1995) has been proposed to advance the analysis of complex social phenomena while offsetting the limitations inherent to each method. It should be emphasised that using mixed methods does not necessarily create a mixture of scientific paradigms (e.g., interpretivism vs empiricism) but rather a combination of different research strategies and techniques that reflect upon these paradigms and how they are applied (Sandelowski, 2000). Furthermore, the use of exploratory mixed methods (Cresswell, 2015) has proven very useful for collecting information, which can brief subsequent data collection, inform about the social phenomenon of interest, and enrich scientific concepts.

The current research model was exploratory, given that the central aim was to generate new insights about Internet accessibility in the rural
environment through different lenses (Robson 2002). One great advantage of this approach was its flexibility and adaptability, as new insights captured during the research process could be rapidly incorporated to improve the methodology. Notably, the flexibility of an exploratory design should not be mistaken for the absence of direction. Instead, the focus of the study was initially broad and became narrower as the research progressed (Adams and Schvaneveldt, 1991).

Figure 5 Exploratory Mixed Methods Design

The following sections describe the two phases of the research project in more detail, including a description of the methods applied in each of them.
3.3 PHASE ONE: INITIAL EXPLORATION OF INTERNET ACCESS IN PENDEEN

As noted in Section 3.2., the exploratory mixed-methods approach started with a qualitative exploration of the study site to gain an initial understanding of the role of the Internet in the inhabitants’ daily lives and to provide empirical data to inform the subsequent design process for the research (see Figure 5, Phase One). This section will describe the qualitative methods used during this initial stage in more detail and explain what insights were intended to be gained and how those insights were used to optimise the design of the second stage. The Cornish village of Pendeen was selected as a study site based on two particular characteristics. Firstly, the village should have a community hall or community centre where the inhabitants and visitors could access the Internet. Because the initial contact was made with the personnel at the community centre, this venue proved to be a valuable point of entry to contact local informants and start understanding the everyday life of the inhabitants in the village. Secondly, as the study aimed to examine digital inequality in a structurally disadvantaged (and commonly overlooked) area, the village should be spatially segregated. During this early research stage, spatial segregation was defined based on the time required to reach each village from the closest city centre (in Plymouth) to Cornwall. Spatial segregation was measured in relation to the use of three types of vehicles (bus, train and car) and the quality of the public transport service according to different days and times during the week. Understanding public transport flow during different times of the day/year resulted useful in explaining segregation as some areas in Cornwall experience a drastic reduction in the public transport service during the late afternoon, weekends and non-holiday seasons even when
they are near larger urbanised towns (which was the case for the village of Pendeen located in between St Ives and Penzance).

3.3.1 *Multiple referral process to explore the village’s connectivity*

Considering the costs required to compile a list of the total population in Pendeen, a chain-referral scheme was considered a more promising alternative to non-probability sampling.

The recruitment of participants was done through a multiple referral process (snowball sampling). The first participant, a Superfast Cornwall representative, provided subsequent referrals to volunteers at the local Community Centre and the Silver Surfers club, as it will be detailed in the next chapter. The Silver Surfers was a group of volunteers that would travel regionally providing basic Internet skills to 60+ citizens around Cornwall. Each new referral provided more data for new people to engage in the research.

This multiple referral process was particularly useful in gaining fast access to many possible participants while ensuring that the chain of contacted people remained within boundaries relevant to the study (Etikan et al., 2016). It also helped to identify some key informants, which later supported data collection and organisation of activities within the village (Bell and Berger, 2003).

However, a limitation encountered through this referral method was that most contacts reached during the first phase were both volunteers at the Community Centre and local commercial traders that would be somehow linked to the Community Centre (by selling their products during the Farmers Market or having any other commercial relationship with the
venue) and visitors/users of the Centre of Pendeen. In that sense, while the initial sample of participants included people from the different neighbourhoods that constitute the village, the sample could not be considered representative, as it did not include those inhabitants without a link to the Community Centre.

Key informants and gatekeepers as coparticipants in the research

Because key informants or ‘natural observers’ could provide more information and in-depth insights into the social phenomena due to their skills or position within a given community (Tremblay, 1957), identifying, selecting and recruiting ‘expert witnesses’ became imperative as a way of gaining reliable access to the village and its neighbourhoods. Traditionally, key informants’ ability in contributing to any ethnographic process relies on their privileged social positions in the research setting, which gives them specialist, extensive and detailed knowledge about other people, processes or happenings (Payne and Payne, 2004). However, because of the explorative aims of this research, key informants became collaborators in reframing the boundaries of the research. To do that, they were provided with detailed information about the initial research aims and methods (Miller and Bell, 2002) and were then allowed to exercise choice and advice on the possible courses of action and focus for the next research activities.

At this initial point of the research, a big challenge was to recruit key informants who would play a central role in convincing the inhabitants of Pendeen that participation in the research project would be worthwhile and that it would not represent a ‘damage to the community or them’ (male 65-year-old). At the time of the study, at least six other research
projects were funded by a major communication company in the UK (Superfast Cornwall, 2017a). Several of those projects had made promises to the inhabitants (e.g., about workshops that should be held in the village), which they later failed to deliver and were not clear about anonymising the collected responses. These experiences had caused considerable hesitation among the population to provide comments or complaints about the rollout of infrastructure in the village.

Key informants were inhabitants of the area with a sound knowledge of the everyday life within the village. Two types of key informants were identified: those working in or directly with the local community centre and the inhabitants of Pendeen and those less engaged with the life in the village, and therefore more critical to understanding the everyday life of the wider population within it.

*Pre-entering a rural village*

The community centre was first approached to initiate contact with the inhabitants of Pendeen. This community centre, the ‘Centre of Pendeen’ (Map 1), turned out to be crucial for this study, as it was a venue for most of the social activities of the village (e.g., farmers markets, movie clubs, language clubs, etc.) and it also maintained close relations with different local and regional businesses, volunteers, and decision-makers.
A volunteer from the centre (female, 72-year-old), was contacted by email and offered to provide information about the community centre’s work and its role as an Internet hub that delivers affordable access to ICTs to the inhabitants of the village and its surrounding neighbourhoods. After an initial informal phone call, she agreed to a personal meeting.

The purpose of this first visit was to introduce the current research project to the members of the community centre and to motivate them to participate in it. During the meeting with the volunteers in the community centre, an information sheet was presented along with a consent form about the PhD project (See Appendix 1). These documents detailed the purpose of the study, the type of information that would be collected and the participant’s rights (Sudman & Bradburn, 1982).
Due to the use of different data collection techniques, these documents aimed to provide enough information to allow participants to understand the purpose of the research project and the different ways in which they could participate in it (e.g., questionnaires or informal interviews). It was also crucial to avoid any biases in their answers (e.g., to imply that technology use would be normatively desirable), which means that the participants should feel comfortable giving honest responses without feeling any pressure of generating ad hoc statements (Oppenhiem, 1992). Therefore, all participants were guaranteed anonymity, as no name or identifiable private information would be revealed publicly.

Figure 6 Process of accessing the village

Figure 6 provides details on the sequence in which the village of Pendeen was approached. The same process was followed in the other hamlets, though the length and order of activities were adapted depending on the local response received. In the case of Pendeen, the pre-entry stage was based on contact through email and phone calls for 3 consecutive
weeks. Thereafter, a Rapid Assessment was developed in four visits to the study site to explore the motivations behind the use of information and communication technologies (ICTs), including the Internet. This stage provided meaningful insights on the cultural norms and the language to be used among the collaborators and participants as well as to obtain permission to collect data (visual and interviews).

3.3.2 Rapid Assessment to approach ICTs in the rural life

After surveying the resources for collecting the data (e.g., the available time, money and informants), it was evident that the application of a rigorous method, such as long-term participant observations, fieldwork or large-scale surveys, was not the appropriate way to start a query in this unknown territory (Singh and Dickinson, 2002; Patton, 2002; Creswell, 2007). In the first phase, the study instead implemented a less rigorous procedure, a Rapid Assessment. This method was the most appropriate strategy to analyse Internet connectivity within the village in a relatively short time frame, thus providing valuable information that could be recovered during just a few visits in a cost-effective way.

Rapid Assessments appeared towards the end of the 1970s and were initially used in the field of development studies in the global south. This distinction is particularly important as explained by the Royal Geographical Society (2015) the idea of a geographical division of the world between the Global South / Global North- follows the development in 1980s of the Brandt Line “as a way of showing how the world was geographically split into relatively richer and poorer nations. According to this model: richer countries are almost all located in the Northern Hemisphere, with the exception of Australia and New Zealand; poorer countries are mostly located in tropical regions and in the
Southern Hemisphere”. Recovering this distinction allows to observe how some research strategies on development issues can be successfully applied beyond geographic boundaries in similarly impoverish contexts. They were used to evaluate the local knowledge on different developmental issues, allowing researchers to plan and to act fast while in the field (Chambers, 1994). Because Rapid Assessment is a tool that allows researchers to collect data in a fast and organised way, it reduces research expenses and facilitates the gathering of data based on specific, pre-defined topics. Bernard (1994) described Rapid Assessment as an exercise of ‘going in and getting on with the job of collecting data’ but without spending months performing ethnographic analysis in order to develop rapport. This conception of Rapid Assessment meant to go into the field situation armed with a checklist of data that needed to be collected.

Figure 7 illustrates the Rapid Assessment employed in phase 1 of this research project. It followed a structure that offered flexibility during the research process by using and adapting a variety of tools that were easy to engage with for the local participants. This was intended to facilitate the precision in the collection of data without any unnecessary work and to adjust activities according to the prevailing conditions. Specifically, the Rapid Assessment captured the inhabitants’ different views regarding a) their neighbourhood, their village and their sense of ‘community’ in relation to the use of digital technologies; b) the different ways in which digital technologies were used to interact in their locality; c) their general perceptions about Internet-based infrastructure; and d) the role of ICTs (smartphones, notebooks, tablets, etc.) and the Internet in their everyday life.
The Rapid Assessment was carried out inside the Centre of Pendeen, where the researcher’s role was that of a facilitator rather than that of a controller of the investigation process (World Bank, 1994). During this phase, the inhabitants of the village assumed the role of contributors (Chambers 1996) by sharing, developing and analysing their local knowledge and helping the researcher to understand the living conditions within their village.

*Figure 7 Activities during the RA*
The next subsections will describe the techniques that were used in the Rapid Assessment in more detail, explaining the objective of each technique and their progression toward capturing the state-of-the-art of the Internet in Pendeen.

*Informal semi-structured interviews*

The idea of using semi-structured interviews was based on a constructivist perspective of social reality and attempted to understand participants’ living conditions by approaching them through their own perspective and on their own terms (Denzin, 1989; Robertson & Boyle, 1984). Interviews were designed to elucidate the role of digital technologies in the daily life of the inhabitants, analysing how they accessed, interacted and incorporated Internet technologies in their everyday life. Participants were asked to share their thoughts regarding a) the type of digital infrastructure available and used in their villages, b) the availability of Internet connectivity, and c) the superfast broadband connectivity.

*Questionnaires*

To gain a more general understanding of the use of digital technologies in the village of Pendeen, several questionnaires were distributed in the local Community Centre (Appendix 2). These questionnaires assessed the different views of the role of technological infrastructure in the individual lives of the inhabitants and as part of a specific area of social contact. They contained basic questions regarding the spatial boundaries of their village and neighbourhoods, their access to the Internet, and their main thoughts relating to their Internet connectivity.
Collective Activities

In addition to directly questioning the role of the Internet, the study also involved a number of collective activities that were carried out to develop a better understanding of how the village dwellers interacted in their everyday lives. Specifically, they were asked two questions:

How do you communicate with others?

This question was simple and offered participants different choices for communication: a) e-mail, b) landline, c) mobile phone, d) social media, e) letters, and f) face-to-face communication as sources for interaction, irrespective of how often they use the media. Each participant had the chance to choose one or multiple of these options. The activity was developed at the local Community Centre for three consecutive weeks in the autumn of 2014. The results of both exercises were not intended to provide generalisable insights about the village (because of the small and non-random sample of volunteers) but merely to gain a first-hand understanding of the dynamics and perceptions about technology and the Internet within the rural settlement. This information was used to aid the interpretation of qualitative information received from the participants and to guide the collection and analysis of data in phase 2.

What does the Internet mean to you?

This open-ended question was intended to avoid influencing participants’ responses, allowing them to describe the Internet freely (Image 1). The activity was designed to obtain information about participants’ views of the Internet without influencing their responses. A total of 34 comments were collected in the village of Pendeen. As noted above, the responses obtained were not representative (because of the small sample size). Therefore, they could not provide general conclusions about the way the inhabitants of the village perceive the Internet. Nonetheless, they offered valuable
insights into the public perception of the technological infrastructure. They revealed some recurrent problems when collecting information on remote and/or isolated areas such as those chosen in Cornwall.

*Image 1. Activities in the Village of Pendeen*

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**Seasonal Diagramming**

The experience of everyday life in rural settlements oriented toward the tourism industry has proven to be closely linked to different seasons. Cornwall’s economy is a clear example of that. Since the closure of the last tin mine in 1998, the Southwestern regions started to depend increasingly on their beaches, art galleries and Areas of Outstanding Natural Beauty that attract tourists to the region. However, this emphasis on tourism has had a clear cost. During the summer months, most of the coastal area in Cornwall, including Pendeen, enjoys a reliable and constant transport system, and leisure amenities such as galleries, cafes and museums are open almost every day. Yet with the change in seasons also comes a decline in the access to those services.
The public transport network becomes sparse, while the opening hours of local amenities are reduced significantly among the rural neighbourhoods, disadvantaging the living conditions in these areas.

Through Internet search and phone calls to different commercial sites, data about the provision of services to the village of Pendeen were collected and used to inform about the different cycles followed by the village in the course of a year-time. This data was used to inform about the spatial distribution of services in the study site, where much of the transport system and the local amenities are oriented toward the tourists and non-Cornish (outsiders) residents who visit or live in Cornwall also referred by the locals as the ‘emments’, (also emit or emit) which is commonly thought to be derived from the Cornish-language word for ant, as an ‘analogy to describe how both holidaymakers and ants are often red in colour and they are just seen during the summer clogging the narrow local roads and generally getting in the way of everyday life, just to run away when the rain starts’. The abundance of seasonal tourism in Cornwall increases the need of locals to have access to reliable Internet at home or proxy places to get connected throughout the year.

Observations

Observation, as the name implies, is a way of collecting data through observing. This method was used in an unstructured manner during the first study phase, without pre-determined variables. The objective was to define the study site and approach the role of Internet connectivity in the lived experience of the inhabitants of the village. This data collection method offered the advantage of providing direct access to the research phenomena, with high levels of flexibility in terms of its application,
creating a permanent record of the initial views of the research to be referred later on.

The observations performed in this first phase (results explained in Chapter 4, 6, and 7) took place during four visits to the village. Importantly, between these visits, there was also telephone communication with the collaborators of the local community centre. During the last visit, meaningful participant observations were captured during a workshop.

3.4 PHASE TWO: INTEGRATIVE ANALYSIS OF BROADBAND CONNECTIVITY

As noted above, the initially collected qualitative results were used to inform the design of the second study phase that examined sources of digital inequality at three different levels (individual, structural, and socio-cultural). To this end, in phase 2, a door-to-door household survey was conducted with materials that were based on the 2013 questionnaires from the large-scale Oxford Internet Survey (OxIS) that assessed Internet connectivity within the entire UK. Statistical analysis of the survey data provided initial insights into sociodemographic factors contributing to digital divides in Pendeen. These findings were complemented by observations made during the fieldwork, metadata captured during the collection of the survey, and historic records about the structural development of the study site. The integration of these different data sources provided additional rich insights into social, cultural, and structural determinants of Internet use in Pendeen.
3.4.1 Surveying Internet use in rural neighbourhoods

The intention of adapting materials used in the OxIS questionnaires was to create a comparable instrument to measure the particularities that are embedded at a smaller spatial scale other than the Lower layer Super Output Area (LSOA) used to represent the Internet User Classification (IUC) in Britain. The LSOA is the second most granular Census geography available, comprising 32,844 zones of between 1,000-3,000 people or 400-1,200 households. The order of questions and their formulations were adapted to understand which inhabitants were getting connected to the Internet and which were not, as well as to reveal where, how and for what purposes the Internet users among the inhabitants were going online. In addition, inhabitants were asked about their daily life activities to cross-examine the ways in which their everyday lives were affected by the use of technological infrastructure. Some of these queries were also guided by the observations recovered in phase 1, where visits to the studied site and workshops with the inhabitants were performed.

For the collection of accurate data, three different questionnaires were employed, covering the different views of Internet users, non-users and ex-users. At the beginning of each interview, participants were asked to classify themselves within one of those categories. Based on their initial response, they were inquired on specific topics (Appendix 4). The three formats of the survey shared some general queries about the availability of different technological infrastructure at home, daily life activities, and socio-demographic variables (see Appendix 4 for details). They were developed as interviews that could be completed within 25-45 minutes. Overall, questions were designed to assess the socio-demographic characteristics and geographical distribution of connected and disconnected inhabitants and to explore what other forms of material
access to technological infrastructure were available for the inhabitants of the case study in their daily lives (i.e., accessing the Internet in a place other than home or using a proxy to access the Internet).

The initial set of questions was used to assess the availability and use of Internet connections and ICTs (both defined as physical infrastructure) in each household. The remaining queries were tailored to the type of respondents, collecting information about where and how they were accessing the Internet. After the generation of rapport, participants were completed socio-demographic and geographic questions to enable the analysis of links between person variables and access to Internet connectivity. The results of the three questionnaires were combined in a single dataset.

Considering that face-to-face interviews have shown to improve the quality of the data by the likelihood of getting high-quality answers increasing the proportion of people who complete surveys (the ‘response rate’), and that resources such as time and money required for conducting this research were very limiting, the survey was mostly performed face-to-face, following the recommendations of the developers of the OxIS (Dutton and Blank, 2013).

In contrast to the OxIS, which aimed to reach a nationally representative random sample of more than 2000 participants aged 14+ in England, Scotland and Wales, the survey developed in phase 2 of the research project focused on householders, i.e., people aged 18+ and living in the different neighbourhoods with close proximity to the urban centre of Pendeen. To collect as many responses as possible, and to minimise potential biases in the recruitment of participants, every household within the study site was approached on at least one (and up to three) occasions
A local assistant-interviewer was hired to increase the margins of confidence of the respondents. This assistant-interviewer, a volunteer involved in many of the social and cultural activities taking place in the village, supported during the recovery of information and had an important role not only in the collection of data, but also as a gatekeeper, helping in the generation of trust bonds with the inhabitants.

Overall, the survey consisted of 225 items, which is approximately half of the size of the 2013 OxIS. The major collection of information took place between September 8 and September 13, 2016. During these days, every house within the village of Pendeen and the vicinity neighbourhoods was visited on at least one occasion if a hard refusal was addressed, or when the residents in the household were holidaymakers rather than the household owners. Some other houses were visited later in up to three occasions if no one was at home during the first visit or when they responded through a soft refusal (e.g., if they declined because they were too busy at the moment of the first contact). In those cases when householders were unavailable, they were asked if they could respond to the questionnaires on their own or if another visit to the household should be scheduled. The cases that accepted filling the survey on their own were retrieved at the community centre of Pendeen or were collected by the researcher or the assistant interviewer.

Overall, 1208 households were approached, out of which 353 turned out to be present on at least one occasion and eligible to participate in the study (i.e., actually have their primary residence in Pendeen). From those eligible households, 122 participants agreed to participate in the survey, reflecting a response rate of 34%. 81 of those surveys (66%) were collected in person, while the remaining surveys were collected or
received during the second and third round of visits (24%) or retrieved at the community centre of Pendeen (10%) before the 23 September 2016.

To evaluate the representativeness of the study sample, it was compared along several demographic characteristics (age, gender, employment types) to the most recent census data from the postcode areas corresponding to the study site. The mean age of the study sample was 59.5 years, which was slightly higher than the mean age of adults in the census data (52.4 years). As shown in Figure 8, the study sample contained a higher proportion of inhabitants in their 60s and 70s and a lower proportion of inhabitants in their 30s and 40s. Finally, regarding employment status, 39% of the participants were employed at the time of the study, while 42% were retired, 13% were unemployed, and 6% were students. In the census data, the proportion of employed inhabitants was higher (60%), whereas the proportion of retired inhabitants was lower (20%). In contrast, the proportions of unemployed inhabitants (13%) and students (7%) were almost identical.

Overall, these results are indicative of a sampling bias, whereby female and retired inhabitants were overrepresented and male and employed participants, especially those in their 30s and 40s, were underrepresented (Figure 9). This bias likely reflects that employed inhabitants were less likely to be available and/or at home than retired inhabitants when the survey took place. However, as it was previously mentioned, all participants were given the option to fill out the survey on their own and retrieve it back to the community centre on a later date. But it must be noted that from those participants who expressed to be arriving to or on the way to their job it was observed that the ones who agreed to keep the survey to fill it on their own was because they wanted
to complain about their broadband service or have had a negative experience when wanting to get connected. While these biases in the data collected are acknowledge as limiting the generalisability of the survey results to the whole population of Pendeen, it should be emphasised that the study sample was significantly larger and considerably more diverse than those of most existing studies on digital inequalities in rural neighbourhoods, and that the final sample (despite the undeniable presence of biases) resembled the population reasonably well. Moreover, it should be kept in mind that the observed sampling bias likely led to a higher proportion of participation from non-users (e.g., participants that were unemployed, sick or disabled, caring for someone, 60+years etc.), which could facilitate the understanding of the particularities of this group regarding Internet access and connectivity.

*Figure 8 Participation by age distribution*

![Figure 8 Participation by age distribution](image)

**Note:** histogram displaying the age distributions of the study sample and the 2011 census data of Pendeen. Age bins are reproduced from the census data, but note that they differ in size.
Data preparation

All surveys were entered into .csv files compatible with statistical analysis software (JASP, SPSS, R) and ArcGIS. The variables were captured using numerical indicators for labels indicated in the data collection section, apart from the postcode. Four checks for accuracy of the data entry were made on all questionnaire responses.

Initially, the data analyses employed descriptive statistical techniques (e.g., means, percentages, ranges, variances) to characterise the socio-demographic characteristics of the sample. Subsequently, inferential statistical methods (e.g., independent-samples t-tests, Chi-squared tests) were used to compare users and non-users of the Internet along those variables. Lastly, a set of regression analyses was conducted to obtain insights into the mechanisms by person variables affect Internet access.

Note: Pie charts illustrating the proportions of different employment statuses in the study sample and the 2011 census data of Pendeen.
and use, and to what extent the effects of different variables are independent or interactive (see above and Chapter 6 for details).

The survey did not ask for any confidential information that could be used to trace individual responders, they did ask for participants’ postcode. If the postcode was not provided at the time of the interview, it was estimated by the location of the interviewer. This information was used in subsequent analyses to generate spatial visualisations of the collected data using ArcGIS.

3.4.2 By-products of the Quantitative Phase

In addition to the person variables described above, the current study also produced a number of so-called by-products. By-products are data that added meaning to the survey data collection process and broadened the research including observations, paradata, emails and photographs. Traditionally, by-products have been considered as secondary outcomes that belong to the ‘background or context of the analysis’ (Edwards, 2017), and therefore are not elements for analysis on their own. This has to do with a predominance of the methods from the natural sciences within the social sciences, which lead to neglect the analysis of by-products and ponder for more formal data collection and analysis strategies. Dominant notions of ‘empirical legitimacy and political alignment’ (Hugues, 2013) keep guiding what is being researched and how it is being researched, and often discourage the use of by-products.

In recent years, however, by-products have regained importance in social sciences research. Edwards (2017) has generated a comprehensive overview of the current efforts to include these data to establish a better informed and more integrative understanding of social phenomena by
providing additional insights from the side of interviewers, interviewees, and general participants of the research. It must be noted that in the case of this research the responses and comments received during the collection of the surveys and during the fieldwork stage were separated. This was done mainly because the surveys were collected in an anonymised way, therefore the comment received during the fieldwork could not be linked to a specific survey respondent. The next subsections will explain the different by-products that were collected during the second phase of the research.

Paradata

The term of ‘Paradata’ was coined by Couper (1998) to refer to the by-products of data collection in survey research at either macro levels (the whole survey) or micro levels (survey cases). In a more generic way, it includes all auxiliary data collected that describe the data collection process (Beaumont 2005; Couper and Lyberg 2005; Kreuter and Casas-Cordero, 2010). During phase 2 of this research project, different paradata were captured during the collection and preparation of the survey. At a macro level, this included comments from the two interviewers regarding the whole data collection process, including the dates, times, and contact attempts (defined as visits) to households and neighbourhoods; the type of respondents (e.g., if the respondent was an elderly person wanting some social contact or a caretaker of a disabled person); the difficulties encountered in collecting the data (e.g., if people were not at home or having dinner/family time without wanting interruptions), and the problems faced while asking certain questions to specific populations (e.g., asking elderly people about the use of online dating sites).
At a micro level, the paradata reflected upon the characteristics of specific respondents or situations that were of interest to the main research but were not included in the topics of the general survey (e.g., people having an Internet connection without knowing or wanting the service). All of these elements provided more valuable quality control of the survey data (Nicholas, 2011) and permitted improvement and contextualise of the understanding of the survey data by supplying elements for the evaluation and monitoring during the data collection (see Chapter 7 for details).

**Observations and fieldnotes**

As mentioned in phase 1, on-site observations are one of the most effective tools for researchers to learn about the viewpoints of their study population, where researchers personally visit the study sites and discover first-hand knowledge about the activities, operations, and functioning of a specific system. The data reflect upon the lived experience on the study site. This immediate exposure enlightens researchers on the actual happenings of the system, as compared to what has already been documented in previous studies. Thus, the researcher gets closer to the context in which the phenomenon of interest occurs.

Observational notes reflect upon ‘events experienced principally through watching and listening. They contain as little interpretation as possible and are as reliable as the observer can construct them’ (Schatzman and Strauss, 1973). The observational notes explore the ‘Who, What, When, Where and How of human activity’ (Schatzman and Strauss, 1973: 100), capturing different important events experienced and recorded by the researcher, comprising pieces of evidence for upcoming propositions about the explored context or situation.
The use of fieldnotes, based on observing the study site, can help understand how the researcher and the interviewer position themselves in the research, allowing psychosocial, interpretivism or interactionist insights into the identities of research participants and interviewers. In parallel, using fieldnotes is a useful tool to interrogate the place of the researchers in the data-gathering process.

In phase 2 of the study, surveys were collected in a one-month period within which different observations were also performed in the rural neighbourhoods. During this time, the researcher became an active participant in the general day-to-day life within Pendeen and its surrounding neighbourhoods, observing their structure, including the village distribution (as a network of neighbourhoods); the location of landmarks, roads, bus stops and different commercial and social places; the provision and access to basic services like the public transport network, schools, GP, Internet Hotspots and the location of the Internet cabinets and Internet Exchange. The systematic capture of fieldnotes turned out to be extremely valuable both for the analysis of rhythms of life within the village based on the distributions of different types of infrastructure (see Chapter 6) and for the delineation of individual case profiles that could enrich and contextualise conclusions from the survey data through the lens of individual experiences (see Chapter 7).

Collectively, the analyses of observations in the second study phase can be considered what is often called a “thick description” in the Social Sciences. This term was first introduced by the Philosopher Gilbert Ryle and subsequently applied and developed by the anthropologist Clifford Geertz in his book The Interpretation of Cultures to denote a description of human social behaviour that goes beyond the physical and adds a
record of subjectivity and context. Thick descriptions are intended to make observations more accessible and meaningful by grounding them explicitly in the specific social context.

This form of observational research is referred to as ‘analytical’ throughout this thesis to emphasise that it aims to explain mechanisms that underlie human behaviour. This is distinguished from forms of analysis that are referred to as ‘descriptive’ if the respective research merely establishes links between observable variables without attempting to offer theoretical explanations for those links.

3.4.4 Internet Speed in the study site

With the aim of understanding changes in Internet access on the study site, several attempts were undertaken to obtain access to anonymised data about the use of broadband and superfast connectivity on the study site (e.g., the maximum and minimum upload and download speeds). After receiving negative responses from BT and Superfast Cornwall stating that ‘providing data on who is connected contravenes data protection and ISP commercial terms’, data corresponding to the postcode areas of the study site were recovered from Ofcom for the years 2014-2017. For 2018, data for each postcode area was accessed using the BT line-checker online tool (Image 2) that estimates the fibre speed available at each premise and the cabinet to which the property is connected, using a random sample of addresses. Therefore, spatial references should not be assumed to reflect the exact addresses of respondents. Note that the data from 2014-2017 represent only an average of the broadband speed per postcode area, while the information for 2018 is given per randomised address.
3.4.5 Ethical Considerations

The PhD researcher was involved during the whole research process as an observer and interviewer, capturing and analysing data. In order to lower the risk of any bias on the information captured about the respondents or their experiences, all data was anonymised and kept confidential, following the UCL ethical regulations. Particular care was taken to ensure that the participants’ rights were upheld and that the research was conducted in an ethical manner.

The research project was initially titled ‘Internet and Urban Media for Social Neighbourhoods: Broadband in rural Villages of Cornwall’ with the study ID number 6028/001, and was granted with Ethical approval by the Research Ethics Committee and Data Protection Registration reference No Z6364106/2014/08/04, section 19, on social research by the UCL Data Protection Registration on 2014 to phase 1 of this research. An extension was received in 2015 to pursue phase 2 of the study, and a final
extension was received in 2017 for the dissemination of preliminary results and public engagement activities in the village. Copies of the approval and extension letters can be found in Appendix 1.
Chapter 4. Approaching Pendeen’s use of ICTS
4.1 INTRODUCTION

Chapter 2 detailed the great potential of the Internet as a transformative technological and communication tool that can offer its users massive and global communication and information capabilities (Castells, 2000; Lévy, 1995). At the same time, it also emphasised the challenges of promoting the development of the Internet inclusively. Due to these challenges, the success of the mass deployment of broadband infrastructure in encouraging the economic and social development of more isolated and sometimes deprived regions cannot be taken for granted. Instead, in places where the structural access opportunities to the Internet have been advanced, area-based research is needed to identify the extent to which such technological enhancements have been translated into meaningful benefits for the inhabitants (Flora and Flora, 1993; Casey, 2005).

In a first step towards doing this, the current chapter explores how the inhabitants of the village of Pendeen experienced the rollout of superfast broadband in 2014 and to what extent this rollout led to changes in the use of ICTs in their everyday lives. To this end, a Rapid Assessment was applied, which included a number of participatory activities designed to enable local inhabitants to portray their experiences with ICTs through their very own perspectives (and with minimal bias caused by researcher preconceptions). This work provided critical first insights into the use of ICTs within the rural neighbourhoods of Pendeen and also formed the basis for the design of the second study phase presented in chapters 5-7.

The remainder of this Chapter is divided into five sections. The first two sections introduce the problem of rural connectivity in the UK (section
4.2) and present the problems surrounding Internet connectivity in a remote rural village such as Pendeen (section 4.3). The subsequent two sections detail the Rapid Assessment that was performed in the village. Initially, section 4.4 outlines the motivation of the Rapid Assessment and describes the different participatory activities that were conducted. Thereafter, section 4.5 presents the key results that were obtained. Finally, section 4.6 explains how the insights gained from this initial study phase influenced the scope and design of the second study phase.

4.2 CONNECTING RURAL AREAS IN THE UK: THE VILLAGE OF PENDEEN

A common romanticised idea about life in rural areas is that people living remotely want to escape from the chaos of urban life and the neverending multimedia contact. While this notion can describe the desires of some inhabitants and tourists visiting the countryside, it neglects the actual requirements of most residents that are similar to those of populations of any other suburban area or city, including the demand for good and reliable communication systems. According to the Office for National Statistics (ONS, 2014), the rural population will have increased by 6% by 2025. Based on the census data of 2011, the Department for Environment Food and Rural Affairs (DEFRA) pointed out that 9.3 million people (17% of the total population in the UK) were living in rural areas, and around 581,000 people (1.1% of the population in the UK) were living in settlements in a sparse setting (DEFRA, 2018). If the population living in rural areas is expected to increase, an increase in the population living in remote settlements can be expected too, which requires the local governments to consider new strategies to improve the
4.2.1 Internet Connectivity in the Rural UK

Rural neighbourhoods generally present a tendency to be excluded from full and active participation in economic and social life. The OECD has identified the underlying geography of distance, critical mass, and density as some of the most challenging factors to the adequate provision of services in rural areas.

Firstly, the distance between rural areas and major urban centres generates a surcharge over all forms of connectivity. From long road
networks that are not cost-effective to power and Internet lines strung lengthways suffering line degradation, distance is a problem that is difficult to tackle (OECD, 2010; 1993). Secondly, in many rural regions, the population level is so low that it is difficult to achieve scale economies of production of many goods and services (i.e., reaching a critical mass), including public services. When there are too few people in a rural area, it is not profitable to provide services in the same way that is done in more urbanised areas. Finally, distance and a low critical mass result in low density, which is a crucial factor in many rural regions. In urban areas, a higher population density in a geographic space facilitates connectivity. However, rural regions are formed of different types of settlements, some sparse, others isolated, where people are scattered across much of the territory, making the connectivity among regional services harder to achieve. In other words, those living in more isolated and sparse dwellings present a higher risk of becoming disconnected from the benefits of regional improvements in living standards and from the intended effects of national policies.

Some rural areas are fortunate to have their populations clustered within a small number of neighbourhoods, which facilitates the delivery of basic public services to a higher number of people. For the case of this research, we are considering the definition of the OECD (2010: 20) on public services that states that are those services provided directly by the government (e.g., police protection or building inspection) or indirectly where the government is not the direct provider but still plays a role in their provision through regulation or financial contribution (e.g., solid waste collection and disposal, or the provision of telecommunication services).
However, other rural areas present dispersed settlement patterns among large territories, increasing considerably the costs of installing or enhancing the required public service infrastructure close to them. Because of their scattered distribution, some rural areas can exclude some of their inhabitants socially from the main activities of the region. Social exclusion in this sense should be understood beyond income poverty and should be analysed as a locational issue, where area-based factors and their dynamics play a role in disadvantaging certain populations.

As discussed in Chapter 2, ICTs have the potential to reduce the distance penalty faced by rural regions, yet the provision of the technological infrastructures required for that is spatially bounded. In many instances, people living in rural areas suffer distance penalties when exchanging goods, services and ideas. A number of the UK’s more remote regions have been suffering from a lack of reliable broadband access for many years now (SQW, 2013; OfCom, 2014-2018). They are the so-called ‘not spot’ technologically disadvantaged pockets within the country, where broadband connectivity is marginal or totally absent. Those living in not spots have been cut off, disconnected from the new technologies, and dependent on outdated and unreliable dial-up modems or expensive access to satellite services, while more urbanised locations enjoy the constant increase in bandwidth.

4.2.2 Internet Access and Not spots in Cornwall

Since the beginning of the 21st century there have been several efforts from the UK government and the private sector to update broadband adoption in Cornwall. However, these well-intentioned efforts have
turned small, isolated neighbourhoods in Cornwall into not spots, where unreliable or even unavailable Internet access has been the norm rather than the exception (CRC, 2009).

A promise of change arose again in 2011 when the Superfast Cornwall project proclaimed being able to make Cornwall and the Isles of Scilly some of the best-connected places worldwide. Superfast Cornwall (2014) pledged to provide a fibre-based superfast broadband rollout that would transform people’s work and leisure and enhance the economy by enabling local businesses to work more efficiently, regardless of location.

The improvement in technological infrastructure that took place in Cornwall provided a unique window to understand its effects on the people more in need of such a project, those inhabiting the most rural, remote settlements. For relatively isolated rural sparse neighbourhoods, the superfast broadband rollout represented many great expectations (e.g., better communication channels), but also practical challenges (e.g., including the Cornish not-spots in the connectivity map and even, perhaps, turning them into superfast hotspots where everyone could have access).

4.2.3 Internet Connectivity in Cornwall

In a country like England, where reports show that 91% of the UK’s landmass has access to a good 4G mobile coverage, and 94% of premises can access superfast broadband with a download speed of at least 30 Mbit/s, most people would expect to be able to go online wherever they are. However, sparsely populated rural areas that offer low commercial incentives to provide coverage still present limited or no Internet coverage at all (OfCom, 2018). Cornwall, a region with a high
disparity in access, contains some of those ‘disconnected areas’. Cornwall is an area with deficient Internet connectivity, with overall Internet speeds 31.83% worse than the United Kingdom’s national average of 36.66 Mbps (FairInternetReport, 2019). The most common broadband provider is BT, offering speeds that range from 22.58 to 41.55 Mbps (FairInternetReport, 2019).

Because mobile connectivity depends on the service provider’s coverage, each mobile network can have better or worse coverage depending on where the users are located. While the use of an online coverage checker can help to understand better the provision of the service, the signal strength in rural areas can be highly affected by diverse factors such as the distance from the communication towers, trees or thick building walls, which can lead to poor mobile reception or even the total unavailability of service. As a consequence, it might be possible to make phone calls or use mobile Internet in the more densely populated towns of Penzance or St Austell, where signal strength is higher, but the inhabitants of smaller and segregated rural areas would have to rely on the use of cables and wires, providing that their neighbourhoods are located in not spots, where coverage is just partially available in the best of the scenarios.

Broadband could be seen as the most accessible way to connect to the Internet in the most rural and isolated parts of Cornwall. Broadband has been a step forward from the narrowband standard dial-up Internet access, providing an increased capacity to receive data and improving the connection’s speed. It has allowed users to access web pages more quickly, download larger amounts of data and use services that require streaming content, which was not accessible through traditional dial-up
connections. To connect to the Internet, most people use a Digital Subscriber Line (DSL) connected to their telephone line or a cable modem connection offered by a cable company. Broadband is also available using other technologies, including wireless (radio), satellite technology and power lines.

According to Ofcom (2015), the most popular types of fixed-line broadband in the UK are Asymmetric Digital Subscriber Lines (ADSL), cable and fibre. ADSL (Figure 10) is the most commonly available type of broadband, delivered through the copper wires of the phone line. In the UK, two types of ADSL technology are used: ADSL1 and ADSL2+. In theory, ADSL1 is capable of a maximum speed of about 8Mbit/s, and ADSL2+ is capable of a maximum speed of about 24Mbit/s. However, in reality, the actual speed that each type of broadband can provide depends on the distance between the household and the nearest telephone exchange. Greater distances are associated with lower speed. Therefore, the actual speed of Internet connections tends to be significantly lower than the maximum speeds advertised by most Internet providers. It is also important to note that while most of the UK territory is covered by ADSL-enabled areas, the distance from the Internet exchange and from the internet cabinets can play a role in getting an available service because of the limitations of the technology used (BT, 2018).
Note: Broadband signal travels considerable distances along the copper cable from the local Internet exchange to the street cabinet and then along another cable from the street cabinet to the nearby residential premises.

The broadband signal from the exchange will suffer attenuation as it travels along the cable from the exchange to the broadband modem (Figure 10), reducing the speeds that can be delivered. In general, the longer the distance between the modem and the exchange, the more that signals will be attenuated, as shown in the Figure 11 below.
Households in remote or newly developed areas, where an exchange has not been enabled or where an Internet cabinet has reached its full capacity, can express interest in receiving Internet access by registering their demand with an Internet Service provider to have an exchange or a cabinet enabled to provide them with the service. However, such registrations need to reach a pre-set trigger level to be implemented, making the rollout more expensive at the cost of lower network coverage, and further disadvantaging rural neighbourhoods with a low-population density. ADSL services are available for around £20-£30 a month, and there may be an installation charge.

An alternative to ADSL is fibre broadband, delivered via clusters of fibre optic cables and can reach higher speeds. The two types of superfast fibre broadband available in the UK are ‘fibre-to-the-cabinet’ (FTTC) and ‘fibre-to-the-premises’ (FTTP). FTTC (Figure 12) means that fibre optic cables run from the telephone exchange to street cabinets before using standard copper telephone wires to connect to homes. With coverage of over 95% of the UK territory, most fibre connections are fibre-to-the-
cabinet services and are typically sold as offering speeds of ‘up to’ 80 or 160Mbps.

*Figure 12 FTTC Service*

Note: FTTC involves using fibre optic cables from the local Internet exchange to the street cabinets which then connect to a standard phone line to provide broadband. This is combined with a copper cable from the cabinet to the home, using VDSL or similar technology delivering much faster speeds over shorter distances.

Figure 13 below presents the expected speed of FTTC service for different distances from the street cabinet for a clean connection. Broadband users within about 300m of the street cabinet could expect to achieve about the maximum possible downlink connection speed (currently 80 Mbps). Speeds would fall to about 21 Mbps when 1.5km meters away from the street cabinet and, at 2.5 km, about 12.5 Mbps connection speed can be achieved.
Importantly, however, the Internet speed could also be affected by crosstalk interference, which can reduce the speeds, particularly if there is a significant number of other fibre broadband connections served by the fibre street cabinet.

FTTP broadband involves fibre optic cables running directly to the household and is faster than fibre-to-the-cabinet. The FTTP service can offer speeds of up to 1Gbps (i.e., 1,000Mbps) but currently only constitutes a minority of broadband connections in the UK. At the time of this research project, it was just starting to be available in the most populated parts of Cornwall.

It is important to note that the Openreach network uses fibre-optic cables to deliver broadband from the telephone exchange to the cabinets on the street but then relies on copper wire to deliver broadband from the cabinet into the households. This less efficient copper wire is the so-called ‘final mile’ that slows the real speed of Internet connections in each household. In the UK, the Openreach broadband network, formerly
owned by BT, is used by the larger Internet providers, including Sky, TalkTalk and Plusnet, delivering Internet to most customers with a maximum average speed of 67Mbps. Virgin is the only major Internet provider not using Openreach infrastructure and owning its fibre broadband network, providing even more competitive speeds. Nevertheless, it is not available everywhere in the UK and is currently reaching only a few of the most populated areas in Cornwall.

In summary, the inhabitants of rural scattered areas tend to face cumulative structural disadvantages in accessing new technologies such as the Internet compared to their counterparts living in more urbanised areas. Consequently, numerous private and public initiatives have attempted to bridge this digital divide via the instalment of Superfast Broadband. However, understanding how these initiatives have resulted in sustainable improvements for the local inhabitants remains challenging (Schwabach, 2014). Research that assesses the impact of Internet initiatives is often funded by the providers who are in charge of the technological deployment, which entails obvious conflicts of interest and typically emphasises the successes of initiatives. By contrast, independent scholarly work has emphasised that improving technological access alone does not translate into an increase in its use. Instead, it emphasises the critical role of mediating variables such as motivation, attitudes, and skills (see Chapter 2 for details). To understand if and how technological interventions can promote a positive, sustainable change in rural neighbourhoods, area-based research is needed in places like Pendeen that have recently undergone Internet rollout to understand the role ICTs in the inhabitants’ lives and to identify potential barriers to their adoption.
4.3 THE CASE STUDY: THE EX-MINING VILLAGE OF PENDEEN

In order to appraise the access to Internet infrastructure in the Cornish ‘Not spots,’ the village of Pendeen was selected as a starting point. Here, the rollout of Superfast Broadband started in 2013. By 2014, some residents were already subscribed to the enhanced bandwidth.

Following the criteria used by the OECD (1994; 2010), the rural village of Pendeen presented some of the most challenging factors to receive an adequate provision of services, such as Internet broadband, given its underlying distant geography, the lack of a critical mass of people that could make the investment in new infrastructure cost-effective, and its low population density.

4.3.1 Pendeen’s Location

Pendeen is located halfway between Lands’ End, Britain’s most south-westerly point and one of the country’s most famous landmarks, and St. Ives, a popular destination for tourists in the region that is well-known for its beaches, galleries and art scene (see Map 3). It is located seven miles westward of Penzance, where the closest train station connects the most southwest corner of the Penwith district peninsula with the rest of the country. Because of its location in between some of the most important points of interest in the region, Pendeen appears to occupy an ideal setting to live surrounded by history, culture and natural areas. However, distances in rural areas can be very relative, and Pendeen’s geographic accessibility can be very limited depending on the mode of transport used.
From Penzance, a car would take just around 20 minutes via the A3071 and the B3318 (mayor roads) to reach Pendeen, while a bus (i.e., the A17 or the A3 Atlantic Coasters that are available only during summer) would take almost an hour to cover the same distance with a very limited and unreliable service, passing once per hour between the months of May-September (Map 3). At the end of the tourist season the public transport system would further reduce its frequency by half forcing the
inhabitants to rely completely on the local infrastructure available within walking distance or on the use of private transport to access employment and other key services and facilities.

According to the Cornwall Local Development Framework (CLDF, 2012), a population increase in an area such as Pendeen could yield two possible outcomes. On the one hand, a larger critical mass in the local area could encourage the improvement of public transport options, enabling the provision of additional and more frequent bus services. On the other hand, without such improvements in public transportation, an increase in the population could only intensify the use of private transport, which would increase the problem of distances in the area.

4.3.2 Pendeen’s Critical Mass

Pendeen is a socially cohesive territory, characterised by a shared local identity and common needs and expectations. Still, it has lacked the financial and economic resources to support viable local development strategies (i.e., a critical mass).

During the last three centuries, Cornwall used to have a productive economy based on a diverse range of industries, including metal mining, fishing, china clay production, wool cloth manufacture, quarrying and shipbuilding (Cornwall & Scilly Historic Environment Record, 2014). The area within which Pendeen is located was especially famous for its richness in minerals such as tin and copper. Because of the success of the mining industry in the early 19th and 20th centuries, up to 30% of the county’s male workforce in Cornwall participated in the processes of
mining, the refinement of ore, smelting the minerals, and the processing and transportation of material for export all around the globe. As a village that produced both tin and copper, Pendeen grew rapidly during this time to serve the increasing mining workforce demand. According to the data from the Cornwall Record Office (2012) and the Office of National Statistics (2015) the civil parish of St Just, where Pendeen is located, presented a dramatic increase in its population from 2,779 inhabitants in 1801 to 9,290 in 1861, which represents more than the double of the population registered in the last census of 2011 on the region. It could be inferred that the increase in the number of inhabitants was a result of the flourish of Cornish copper mining industry in the region. As a result of this growth of the mining industry, the county’s economic infrastructure was transformed. Roads were built in Cornwall to transport the materials and the working force to the main two mines: Levant and Geevor Tin Mine.

The Levant Mining Company was formed in 1820 within one of the most ancient hard-rock tin and copper mining areas in Cornwall, the St Just Mining District. Copper, tin and arsenic were mined for generations, and the workings of the Levant extended over a mile out under the seabed. By 1836, 320 men, 44 women and 186 children were employed on the site. Levant's mine produced £170,000 profits in its first 20 years, allowing the introduction of new technology to streamline production, and in 1857 the man engine was installed to carry men up and down the mine. In 1919, the man engine suffered a disastrous failure when a link between the rod and the engine snapped, killing 31 men. After that, Levant experienced a steady decline, and in 1930 the mine had to be closed.
In 1911, a group of Cornish miners funded Geevor Tin Mines Limited to extract tin from the region. The success of the mine lead to the generation of an intricate tunnelling system in the surrounding areas to continue extracting tin for the following 70 years. After the exploration works, Levant Mine was opened again to reanimate the mining under the seabed in the area. The shaft developed from 15 level at an angle of 25 degrees below the horizontal to exploit the tin-bearing lodes in the mine eventually reaching 21 level (2100 feet or 630m below the elevation of the surface) until the low tin prices prevented the completion of the shaft to its final depth. In October 1985, the tin price plummeted overnight from £10,000 per tonne to £3,400 forcing the closure of Geevor Tin Mine only six months later, in April 1986. A rescue programme was put into effect in 1987, finally reopening Geevor on January 1988, with less than 100 miners, but the constant fluctuations in the tin prices led to the final closure of Geevor in May 1991.

The decline of the mining industry forced many Cornish inhabitants to emigrate to seek new lives and employment in mining areas of America, Australia and South Africa. Given the economic depression experienced in the area, the Cornwall County Council purchased the mining site with the idea of converting it into a Mining Heritage Centre that could eventually create jobs by attracting tourists. Groups of volunteers, mostly ex-Geevor employees, worked on adapting the old mine offices, creating a mining museum throughout the winter of 1992 and 1993 and opening Geevor Tin Mine Heritage Centre in August 1993. For those who stayed in Pendeen, tourism and the supply of services became the major economic forces. Until the 2011 census, just three people in the Pendeen area reported to be working in mining and quarrying industry. Please note, that the aforementioned number refers to all people usually
resident in the area at the time of the 2011 Census aged 16 to 74 in employment in the week before the census in the mining and quarrying industry (ONS, 2015).

4.3.3 Pendeen’s Low Population Density

Until the beginning of the 1840s, Pendeen, whose name is believed to be formed from the Cornish words ‘pen’ (headland) and ‘din’ (castle) which refer to the headland and the manor house in that place (IntoCornwall, 2006), was part of the parish of St Just. In 1846, the success of the mining industry generated a rise in the population and Pendeen and some surrounding hamlets became a parish in its own right. The village is part of the West Penwith Community Network Area, and is considered by the CLDF (2012) as a rural service centre that plays an important role in the local area (category D settlement). The residents of Pendeen have access to some local infrastructure, but they will always need to travel to Penzance or other more urbanised areas to access key services and facilities. The Community Network Area contains 14 parishes and diverse smaller towns. Penzance is the main settlement within this area, and acts as the local service centre to the many smaller surrounding towns and villages. Smaller towns in the area include St. Just and Marazion, whilst larger villages in the area include Goldsithney, Gulval, Heamoor, Long Rock, Ludgvan / Crowlas, Madron, Mousehole, Pendeen, St. Buryan and Sennen. Smaller villages include Perranuthnoe, Porthcurno, Rosudgeon, St. Levan and Sancreed.

Pendeen is not a nuclear village, but its population is dispersed among several hamlets, the main ones being Bojewyan, Trewellard, Portheras,
Discrepancies exist about the precise number of Pendeen’s inhabitants. According to the ‘Rural deprivation in Cornwall and the Isles of Scilly: Profile’ for Pendeen, conducted by the Oxford Consultants for Social Inclusion (OCSI, 2009), the village had an estimated population of 656 inhabitants, but this number represented just the central urbanised area of the village without the adjacent hamlets. In order to tackle this difficulty, this project used the information from the last UK Census Data (2011), which provided a more up-to-date number based on grouping different postcode areas of the hamlets that compound the village.

The downside of this approach was that some adjacent neighbourhoods and their populations were counted as part of the hamlets with low population density in the case study, even though they were in fact not part of it. The reason for this is that during the collection of census data, each group area had to contain at least 100 people, to preserve the anonymity of the responses of those living in very small postcode areas, sometimes a single house. The 2011 Census estimated Pendeen’s population to be around 2069 inhabitants, 1015 males (49.1 %) and 1054 females (50.9 %) (though, this number is estimated as it includes surrounding neighbourhoods). There were 211 economically inactive retired persons and 34 with long-term illness or disabilities. Groups particularly vulnerable to exclusion included 135 lone parent households and 110 pensionable age persons living alone.
4.4 PREVIOUS INITIATIVES TO PROMOTE DIGITAL SKILLS IN PENDEEN

As mentioned in Chapter 3, one of the reasons for selecting the village of Pendeen as a case study was that it had previously received some training courses on basic Internet skills provided by the ‘Silver Surfers’; a contact point established directly through Superfast Cornwall, during the piloting stage of the study. The Silver Surfers delivered IT courses in local community hubs all around Cornwall during the rollout of superfast broadband to 60+ inhabitants and also supplied training sessions in the local Community Centre in Pendeen, which served as a link for the current study to contact informants and to start understanding the everyday life of the village.

Considering that the population of the case study was dispersed throughout scattered geography, it was essential to persuade extended participation to gain first-hand local knowledge about the state-of-the-art of digital technologies in the village. This was accomplished through a collaboration with the Centre of Pendeen, and its socially committed volunteers, who provided a direct point of contact with the inhabitants. Within the Centre, a Rapid Assessment was developed from September to November 2014 using a combination of an e-mail exchange with key informants; semi-structured interviews following the sampling method explained in Chapter 3, and a series of participatory and co-creative methods aiming to establish more direct contact with the inhabitants and allowing them to express the role of ICTs in their lives in their own words and with minimal constraints (see section 4.5 for details).
The Centre of Pendeen: providing Internet access in a Rural village

The building currently occupied by the Centre of Pendeen dates back to 1931, when it accommodated the Pendeen Parish Men’s Institute. At the beginning of the 1990s, the Institute was run down, and in need of repair, and by 1996, decisions were made to have the Men’s Institute rebuilt and extended, but the plans were never realised. Finally, in 1999, it was decided to turn the Men’s Institute into a place that all inhabitants of Pendeen could enjoy, and the Centre of Pendeen was created as a registered Charity that was managed and staffed by volunteers. It offers a wide range of activities and clubs such as tai chi, pilates, yoga, table tennis, short mat bowls, the Institute Snooker & Pool Club, a patchwork group, and a bimonthly farmer’s market. The Centre plays an important role as a social hub for the village, but it is also fundamental in providing IT services and technological support to people in the area.

For more than a decade, the Centre has been the only place in the area where people from different socio-economic backgrounds could access training and technological infrastructure to fulfil their most basic technological needs such as photocopying, printing, and using computers. In the Guestbook of the Centre, one could read grateful notes from inhabitants about the service provided by the community venue regarding the use of technology:

‘(…) Superb facilities which I sincerely hope will be used to their full potential. Very friendly reception, which made me feel welcome right away. Much appreciated the use of the laptop computer and broadband connection (Female, 29/03/06)
‘Thank you so much for being able to use your computer when mine is playing up - deadline looming - without you I would have been in trouble’ (Female, 02/05/06).

‘Thank you so much - what a super service! Phone line down at home. Such a help to be able to use Internet’ (Anonymous, 03/05/06).

‘The computer training is exactly what I need, giving **** support and encouragement. To have all this in clean, comfortable and pleasant surroundings locally is fantastic. Long may it continue’ (Anonymous, 27/06/06).

‘Brilliant facility! -To be able to use a computer for preparing work for school (I am a supply teacher without my own computer - Saves a great deal of rush=panic when I arrive at the school at 8am tomorrow. Many thanks to the Centre, centre staff and to Tom for assisting’ (Anonymous, 06/07/06).

4.4.2 The Internet Hub

The Centre of Pendeen operates a similar system as any Internet café providing the use of computers connected to the Internet to whoever requires them. The service is charged with a £2 fee per hour, which has been used to recover the costs of the broadband connectivity, but visitors of the Centre can also have free access to the WiFi of the Centre when using their own devices. As the area generally lacks good mobile connectivity, tourists and holidaymakers are also frequent visitors.

In 2013, the Centre received funding from the Devon & Cornwall Housing Association (DCH) to upgrade its connectivity to Superfast Broadband.
At the beginning of 2014, part of that funding (£750) was assigned to provide free Internet access to people on a low-income base for one year. However, the high demand of this service by a community that is constrained both economically and technologically incentivised the volunteers of the Centre to ultimately maintain the project until the present. To provide this service free of charge, the volunteers at the Centre would use their own criteria to accept whoever mentioned living locally on a low-income basis. The standard could be applied for many of the residents in Pendeen, where the average salaries do not exceed £18,000/year.

The measure of providing free Internet access and training was intended to aid in reducing the digital gap among low-income households in Pendeen. However, volunteers at the centre mentioned that some inhabitants were reluctant to accept the service due to their fear of being stigmatised as poor or as accepting charity within the village. At this early stage, such factors were perceived by the staff of the Centre as preventing the project from reaching a most desired bigger audience.

4.4.3 The Silver Surfers

The Silver Surfers was a project part of the Get IT Together programme that promoted digital inclusion amongst disadvantaged communities across the UK. The project aimed to team up the Superfast Cornwall team with local community leaders to promote technical skills in the local communities. Considering Cornwall’s ageing population, BT focused its financial inclusivity efforts on providing basic digital skills to elderly citizens (60+ years). This was done via 6-week long courses in which the attendants could learn basic technology skills and Internet know-how,
from turning a computer on and off, using a mouse and keyboard, to sending an email or paying bills (see Appendix 3).

4.4.4 The Work Club

A start-up grant from the Job Centre Plus allowed the Centre to initiate a Work Club, so that anyone seeking work could receive help in their job search by using the Centre’s computers to prepare their CVs and cover letters and to access job websites. The beginning of this project was slow, and the volunteers did not receive any attendees for several months, though eventually, the Work Club started gaining some popularity:

‘When people come in and use it, they say: ‘Oh, I will go back to tell my neighbour’, because they liked it and that’s what we need’ (Female, 15 Sept, 2014)

The grant also enabled the Centre to buy six laptops with Windows 8 and some new tablets. The Work Club was a sustainable activity in the Centre, maintaining weekly sessions since 2014.

4.4.5 The Network Training

The Centre also used to have a network training every Thursday for several years. Anybody from the village, who experienced problems with their laptop or software, could attend the training to receive support. In 2014, however, the Centre ran out of funding for this activity, and since then, the Centre has been trying to meet the specific needs of the inhabitants through the help of volunteers. In many cases, these volunteers would be able to provide basic IT support, but they did not
feel comfortable advertising it as such, as mentioned by one of the volunteers:

‘Somebody could walk in, and it could be something I have no idea what to do because I’m not an expert by any means’ (Female, 15 Sept, 2014)

4.4.6 Summary of previous IT initiatives at the Centre of Pendeen

As outlined in the previous sections, Pendeen was a particularly interesting study site, as it had not only recently received structural access to Superfast Broadband Internet, but it had also hosted a number of initiatives aiming to improve inhabitants’ ICT-related skills in order to improve their ability to take advantage of new technologies and facilitate their lives. All of these initiatives were organised in collaboration with the Centre of Pendeen, but they followed complementary strategies and formats: some of the activities were conducted over the short term with the help of external experts to provide structured and in-depth guidance on the use of ICTs, whereas other initiatives were conducted over the long term by local volunteers to provide pragmatic support with individual issues. Both initiatives seem to have improved the situations of individual inhabitants, as evidenced by enthusiastic reports of former participants, suggesting that Pendeen could be a place suitable to study how new technologies become integrated into a rural and structurally disadvantaged area.

4.5 A RAPID ASSESSMENT OF INTERNET USE IN PENDEEN

4.5.1 Aims of the Rapid Assessment

In the course of the first study phase, a number of participatory and co-creative activities were performed to facilitate the interaction with the
inhabitants of Pendeen and enable them to actively contribute to the research process, providing initial insights into the role of digital technologies in their personal everyday lives. These activities aimed to address the following questions:

- To what extent has the roll out of Superfast Internet access in the study site changed the inhabitants’ patterns of Internet use?
- How is Internet use embedded into everyday life patterns? How does this differ from more commonly studied rural environments?
- What do the inhabitants use the Internet for? What would they like to use it for and what difficulties do they encounter?
- Where do people use the internet? Are there any places outside home and work that provide useful access opportunities?

4.5.2 Overview of performed activities

The following section provides a brief overview of the different activities performed, and that, together with observations, enabled initial conclusions about the role of ICTs in the life of the inhabitants.

Poll in a jar: To develop a better understanding of how the inhabitants of the village were interacting in their daily lives, they were asked to generate answers to the question ‘How do you communicate with others?’ through a ‘poll’ system located in the Centre of Pendeen. Participants were asked about their use of mediated communication such as letters, landline, mobile phone, e-mail and virtual social media. They could select as many options as they would usually use.

Comments with post-its: To understand how rural villages were experiencing access to Internet broadband, it was essential to obtain an
overview of how the inhabitants of Pendeen conceived the Internet in general terms. Therefore, the general audience of the community centre, which included both users and non-users of the Internet, was asked to generate answers to the question ‘What does the Internet mean to you?’. This exercise emphasised that there were no right or wrong answers and encouraged participants to express their unfiltered opinions about this digital medium in their very own words.

**Questionnaires:** A set of questionnaires was kept at the community centre and offered to its visitors. Besides basic socio-demographic information, the questionnaire explored the locations at which inhabitants were typically accessing the Internet.

A **focus group** with two core activities: Mapping my network, this activity was conducted as part of a workshop that was conducted in the community and designed to learn more about the inhabitants’ use of the Internet for social relations (i.e., with whom the participants were interacting through the Internet both globally and locally). During the workshop, participants also had the opportunity to speak in teams about their fears and expectations regarding ICTs in their daily life in the village. **Media in my village,** this activity was also conducted as part of the workshop at the community centre. For this activity, inhabitants were divided into three teams of around seven participants each. Each team had a researcher-moderator who presented a set of images related to mass media and internet-based communication in order to generate a brainstorm about the role of the different technologies in their lives and in the village.
4.5.3 **Key results from the rapid assessment**

From the different activities performed at the Community Centre, nearly all of the participants reported having some form of access to the Internet. As such, 98% of those who participated in the *poll in jar* reported owning a mobile phone and 92% reported using it for communication via email. Similarly, all of the inhabitants who completed the *questionnaires* at the community centre reported using the Internet to communicate through emails. The different activities and interactions with the inhabitants furthermore revealed that almost all of them were aware of at least some online mediated services that would be beneficial for them to use (e.g., online shopping, banking, education and research, and communication were among the mediated activities that participants were most aware of).

The majority of inhabitants also expressed clear motivations to use those services. Most of them described this as a new necessity, as their place of living limited their ability to see their relatives located further away, so for them being able to chat using a platform such as Skype provided the only means to keep in touch and have the chance to meet earlier generations. Others would perceive the Internet as an opportunity to create or maintain a business that otherwise would not have a chance to flourish in the area (e.g., selling antiques or collectives from the mining era or homemade products that could be delivered to order). For some of the inhabitants, the Internet would act as a limitless library where they could learn and investigate any topic they could imagine. However, a few others reported using the Internet only as a last resort for services they could no longer perform in traditional ways (e.g., to have a bank problem solved or to set up service payments). For this latter category of inhabitants, the increased digitisation was becoming a cause of concern,
as in the past they were always given the option to receive either face-to-face or at least human support on the phone, which in many cases were no longer available options.

Importantly, when asked about the recent enhancement of Internet broadband in their village, a significant proportion of participants reported being dissatisfied with the quality of their service, referring to it as unreliable and spotty, and expressing similar views about their level of mobile connectivity. This was less of an issue for inhabitants who described themselves as less skilled in using digital technologies and for whom the broadband quality was sufficient to perform their regular activities (e.g., reading the news or sending an email from time to time).

Some participants who complained about the poor quality of the Internet connectivity mentioned “having to chase the connection across the village.” This could explain the inhabitants’ use of the Internet in different locations (as described in the initial questionnaires retrieved). The questionnaires showed that the Internet was accessed not merely at home or work or through a mobile phone but also at the community centre (57%), in cafes (29%), the public library (29%), pubs (21%), public parks or plazas (14%), and restaurants (7%). Interestingly, even those inhabitants who were concerned about their low level of Internet-related skills were accessing public places of the study site to get connected. The reasons for getting connected in those places varied from having access to better connectivity (most places) to getting access to computers (library & community centre) and the availability of social support (library & community centre).

Importantly, as noted above, some of the inhabitants have expressed serious concerns about their own ability to use mediated services and
concerns about lacking human support to overcome their difficulties. Participants of the focus group shared their experiences and challenges while doing banking online: whenever they would struggle with basic tasks such as creating an account, remembering the login details or setting up transactions, they would call the helpline of their bank, which typically redirected them to a computerised service. Such help was usually available when the same tasks were performed manually, e.g., by asking an employee at the bank for help with a transaction. In contrast, the support options of digital services were mostly automated and were not perceived as useful in overcoming difficulties, but rather added on to an experience of frustration and failure (e.g., because the computer would ask questions they did not understand or require information they could not provide). As a consequence, many inhabitants reported high perceived costs of engaging with the Internet with only little return. Some further expressed feelings of anxiety and worries about being left behind by technological progress and expecting to soon be unable to access even basic services once they will be digitised.

4.5.4 Summary and implications for the second phase of the study

The primary aims of the Rapid Assessment were to gain access to the study site, earn inhabitants' trust and motivate them to continue participating in any next stages required, so an initial understanding could be developed about the patterns of life in the village and the role of ICTs therein. These aims were largely accomplished, as several key informants were identified who could facilitate the entry to the study site and the recruitment of an initial sample of local inhabitants who would share their views about the role of digital technologies in their lives. In
addition to these primary aims, the Rapid Assessment yielded a number of important insights that influenced both the scope and the design of the second study phase.

Firstly, the different activities of the Rapid Assessment, as well as the observations conducted in the village, consistently indicated that the experienced quality of Internet connectivity in Pendeen was not nearly as good expected, based on public announcements by the local Internet providers. In fact, most inhabitants had not noticed any improvement in their connectivity since the rollout of Superfast Internet had been initiated. This directly affected the scope of phase 2, as it meant that it was simply not feasible to examine to what extent the sudden improvement of structural Internet access in a disadvantaged rural area would lead to sustainable changes in the inhabitants’ use of ICTs (by incorporating these technologies to their daily lives). Instead, it became evident that phase 2 would be more useful if it focused on identifying the factors and mechanisms that determine if and how inhabitants would engage with limited Internet access provided in their environment. Access gaps remain real in rural areas, even though they are typically thought to be closed in countries like the UK. And while most inhabitants have some form of gadget to get online (especially via a mobile phone), it is important to note that some sectors of the population still struggle to get online, having to go to overcome significant hurdles to do so (e.g., commuting to a different village just to access a computer at the library or the community centre).

Another striking observation of the Rapid Assessment was the frequency with which social support (and especially a lack thereof) was described as a critical factor in determining if one would engage with digital
technologies. Despite a growing awareness of digital services, and a general motivation to make an effort to engage with them, many inhabitants expressed that they were no longer able to use services effectively on their own and would therefore often revert to traditional manual services instead. The problem for many inhabitants was not just a lack of general digital skills but also the lack of easily available resources to receive human support with practical issues. Evidently, the available digital support services were not perceived as helpful and only exacerbated experiences of failure. In many inhabitants, these experiences created associations between Internet use and negative emotions (e.g., helplessness, frustration and anger) and led to either a complete abandonment of attempts to use digital services or a completely task-oriented way of using the Internet (i.e., the Internet was used only in events when no other option was available and only for the specific service for which it was needed). Considering these results, phase 2 adopted a strong focus on the role of social support in facilitating access to and use of the Internet. This was implemented in different ways, e.g., by testing for links between inhabitants’ level of available support and their level of Internet use (see Chapter 5) or by analysing the different forms that social support can take and what kinds of use it can promote or hinder (see Chapters 6 and 7).

The Rapid Assessment also revealed that inhabitants were using the Internet in a variety of public places, such as cafes, pubs, the public library or the community centre. Interestingly, this was the case not only for proficient users but also for those with lower levels of Internet-related skills. Moreover, these places were visited not only for access to otherwise unavailable technology but also for social support with their use. Even though these were clearly just anecdotal observations, they
nonetheless influenced the design of the second study phase, which systematically examined to what extent public and semi-public places in the study site could provide a form of social support that is embedded into the community life and that may facilitate access to digital technologies (see Chapter 6).

Finally, the results of the Rapid Assessment also impacted the sampling strategy of the second study phase. During the activities conducted in phase 1, it became evident that it was insufficient to recruit participants merely via the local community centre. Even though the centre provided an excellent point of entry to make contact with inhabitants and win trust, it turned out to yield a very selective sample that did not seem at all representative of the population in the study site (e.g., all participants were at least occasional users of the Internet). Hence, to reduce this sampling bias, phase 2 of the study implemented a much more comprehensive strategy, in which every household in the study site was approached (see Chapter 3).
Chapter 5. Counting the uncounted: Person variables predicting inequality in Pendeen
5.1 INTRODUCTION

Building upon the previous chapter, it was evident that to understand the digital divide in Pendeen, it was necessary to go beyond the walls of the local Community Centre and approach the broader population in the village. To do so, this chapter reports on the results of a face-to-face household survey that was conducted to identify individual person variables that are associated with Internet use. As such, this chapter focuses on the first level of the digital divide and aims to inform about the differential profiles of Internet users and non-users in the village. Initially, the chapter provides a theoretical background and motivation (section 5.2) and describes the relevant procedures and analyses that were implemented (section 5.3). Thereafter, results from the survey are reported in four subsections focusing on a detailed description of the study sample (section 5.4.1), a delineation of sociodemographic profiles of Internet users and non-users (section 5.4.2), a test for interactions between different person variables in predicting Internet use (section 5.4.3), and a characterisation of Internet usage patterns and reasons for non-use (section 5.4.4). The chapter finishes with a discussion of the theoretical implications of the results as well as motivations for the analyses presented in subsequent chapters (section 5.5).

5.2 UNDERSTANDING INTERNET CONNECTIVITY IN THE UK AND CORNWALL

Ofcom (2014-2020) is one of the most important companies that elaborate an analytical compound about Internet connectivity in the UK. It produces an annual report of developments in the communications sector, which includes an extended section on the Internet and online
content. In doing so, Ofcom’s reports tend to equate access to Internet use. Throughout the years, these reports have generated different typologies based on the attitudes and behaviours of people regarding ICTs, the different types of use, the level of confidence in using the Internet and understanding how search engines operate, and their concerns about the security and privacy of online activities. It was proposed to distinguish between newer users (i.e., those who say they first started using the internet less than five years ago), narrow users (i.e., those who make the fewest different types of online uses) and non-users of the Internet (i.e., those who do not use the internet at home or elsewhere). Ofcom also produces annual reports analysing Internet broadband and mobile reach within the UK. Notwithstanding the quality of the material these reports provide, it remains hardly possible to conduct any detailed analysis below the Local Authority levels because the presented information is provided by broadcasters, telecoms operators and third-party data providers (Ofcom, 2017).

Another important information source to understand Internet connectivity in the UK is the Oxford Internet Survey (OxIS). Developed by the Oxford Internet Institute, the OxIS has been the only extensive face-to-face survey of Internet use in the UK. Based on face-to-face interviews the OxIS greatly improved the reliability of the responses collected, compared to other web-based or telephone-based surveys. It has systematically investigated the use and habits of the British population biannually from 2003 to 2013 and most recently in 2019, and is therefore of unique value for understanding Internet connectivity in the UK. The OxIS has allowed tracking the spread of the Internet as it penetrated different demographic groups, providing evidence regarding changes in the digital divide. It distinguished between users, non-users, and ex-users
of the Internet, generating data sets for the analysis of specific digital
trends and topics. The OxIS followed a strong research methodology
approaching Internet penetrability in a large sample population, by
collecting around 2000 profiles on each exercise through a multi-stage
national probability sample. It had a high response rate that varied from
60% in 2003 to 42.7% in 2019.

The data of the OxIS have served to inform research on broad areas by
providing geographic estimates of Internet use in Britain, including that
of users and non-users of the Internet, and the activities performed by
them (Blank et. al., 2018). Results from the OxIS have also permitted to
differentiate the notion of Internet use (e.g., by including the amount,
variety or different forms of use) and to compare the socio-demographic
characteristics of users and non-users. The latter has yielded clear
differences between their profiles: users are typically younger, more
educated and more likely to be male and employed, whereas non-users
are more likely to be disabled and socially isolated (Helsper & Reisdorf,
2016). Apart from these socio-demographic differences, non-users
commonly explain their reluctance to use the Internet as a lack of interest,
concerns about the costs of the connection and their lack of skills to use
it (van Deursen & Helsper, 2015; Helsper & Reisdorf, 2016).

Nonetheless, despite the immense possibilities offered by these data sets
to inform research and policy in Britain, the OxIS has been of little help
in understanding potentially significant geographic inequalities in
Internet use at subnational levels (Blank et al., 2017). As a national sample
survey, the OxIS does not offer sufficient data from small areas to
estimate Internet usage in specific locations.
At present, while more and more is known about the geography of Internet expansion in the whole UK, there are important reasons to suspect that spatial differences may play a critical role in determining different degrees of access to the Internet when observed on a smaller spatial scale (Anderson, 2007; Longley and Singleton, 2009; Blank et al., 2017). Some of these reasons include the individual inequalities in the access to the Internet, but also the structural disparities in the way infrastructure is distributed among urban and rural areas (Ashmore et al., 2015), which in the end also limits the quality and accessibility to technological infrastructure (Philip et al., 2017).

5.2.1 Limitations of previous research and aims of the current study

As summarised above and in Chapter 2, previous research on Internet usage in the UK has focused mainly on larger spatial scales. Only a few investigations have examined rural areas, and even fewer studies have analysed localised disadvantaged rural neighbourhoods. Furthermore, existing studies on Internet usage within small areas have typically presented key limitations that the current research seeks to overcome.

One central limitation of previous research is that relevant data are often generated through simulations based on extrapolations from National Survey Data and Big Data rather than on the actual collection of new data within the rural areas of interest. Even though this practice can add important analytic insight if it can recover empirical data, it can also lead to misleading conclusions about the specific needs or requirements of the respective population. For instance, Anderson (2007) used stepwise models to estimate time spent online, producing spatial micro-simulation for particular country locations. Longley and Singleton (2009) recovered
Anderson’s work by developing a geodemographic classification that organised areas into categories sharing similarities across multiple socioeconomic attributes. In doing so, they analysed intersections between material deprivation and digital exclusion. However, to date, the accuracy and relevance of these findings for the local populations remain unclear, particularly for those demographic groups underrepresented in national surveys on which the models were based.

At the same time, those studies that have collected data on Internet usage in rural areas typically exhibit some methodological limitations. For instance, Ashmore et al. (2015) examined rural dwellers through a qualitative approach by correlating broadband speed and Internet perception through 36 interviews with two rural community-based superfast broadband organisations in the UK. The study presented novel insights into how the Internet’s penetration, specifically the superfast broadband connectivity, could heavily depend on individual contexts. However, because the study was based on a very small sample and grounded entirely in perception-based questions, the results could not be considered representative of rural Internet usage patterns within the communities, requiring further investigation with larger sample populations and more rigorous analytical methods to provide generalisable results.

Finally, a large amount of existing work on Internet usage in the UK has focused primarily on analysing material access with the implicit assumption that better availability of Internet infrastructure will eventually bridge the digital divide (Philip et al., 2015, Farrington et al., 2015, Philip et al., 2017). However, even though material access is a prerequisite for bridging the divide, a sole focus on access neglects the role of other
important variables, such as attitudes, skills, motivations, and social and spatial factors, in translating material access into actual usage. Recently, multi-facet models of Internet appropriation have been proposed that conceive Internet usage as a complex interplay between structural and personal variables (van Deursen and van Dijk, 2015; Gil-García, 2006). However, so far, those models have only been applied to macro-scale data and not to the study of small rural areas, nor have they been applied within the UK.

In summary, the existing literature on Internet usage within small British areas presents several key limitations, especially the reliance on simulated or purely qualitative data and an excessive focus on material access to Internet infrastructure without providing an overview of the local connectivity requirements. To fill these gaps, an alternative approach is needed that examines the local geographies of Internet access by collecting “small data” about the inhabitants of local areas that are unavailable in census data or through private communication companies. The current study followed this approach by conducting a comprehensive face-to-face survey within the Cornish village of Pendeen. The study aimed to recruit a sample of sufficient size to enable the combination of qualitative interviews with quantitative statistical analyses to provide an integrative account of issues shaping the different levels of the digital divide (see Chapter 2). This chapter will focus on the role of individual person variables in shaping access to the Internet (according to the 1st level digital divide). Through several complementary statistical analyses of the survey data, the chapter will (i) generate socio-demographic profiles of Internet users and non-users, (ii) characterise their patterns of technology use as well as their reasons for non-use, and (iii) test specific mechanisms by which different person variables interact.
with a particular focus on the role of social support as a potential protective resource that can mitigate the negative effects of other variables.

5.3 ANALYSING INTERNET ACCESS IN REMOTE RURAL NEIGHBOURHOODS

After gaining initial insights into the role of ICTs in the daily lives of the local inhabitants through a Rapid Assessment (Chapter 4), the second study phase involved a household survey with a series of questionnaires collected within the neighbourhoods of the study site. The questionnaires were based on the 2013 Oxford Internet Survey (OxIS) that assessed Internet connectivity in the UK. The rationale for designing the questionnaires similar to the OxIS was to reveal the particularities of smaller-scale field sites with a comparable instrument. However, the wording of questions and updating categories were required to represent better the participants' identities (Moody, Obear, Gasser, Cheah, & Fechter, 2013). Therefore, several questions were modified following the observations recovered in 2014 during the pilot stage of this research when visits and workshops were performed. The complete questionnaire can be found in Appendix 2.

Following the guidelines of the developers of the OxIS, the questionnaires were administered door-by-door as face-to-face interviews that could be completed in 25-45 minutes to maximise the quality of the collected data and the response rate. Moreover, to maximise the sample size and minimise potential biases in participant recruitment, every household in the study site was approached up to three times at different times (morning, afternoon, and evening) and on
different days of the week. To increase the margins of confidence of the respondents, and because the study took place in a small rural area, a local assistant was hired. This assistant participated as an interviewer and as a gatekeeper, helping to generate rapport with the inhabitants and providing knowledgeable advice on the rhythms of life within the community.

Participation in the survey was directed to the householders who lived or were present at the addresses within the study site and who owned or rented the accommodation or were responsible or jointly responsible for paying the bills. In cases where the householder did not have time to answer the survey, they were asked about a possible date to revisit their address, or they were left with the questionnaires and asked for a date to collect them. Although several studies have shown that payment can increase survey response rates (Asch et al., 1998; Church, 1993; Doody et al., 2003; and Ulrich et al., 2005) and the hypothetical willingness to participate in research studies (Halpern et al. 2004; Bentley and Thacker, 2004), participants in the current study did not receive monetary compensation for two reasons. Firstly, as this research was self-funded, all available resources had to be allocated to cover the fieldwork expenses and the research assistant’s salary. Secondly, and more importantly, no monetary incentive was given to avoid persuasion or coercion that could influence participants’ responses (Alderson & Morrow, 2004). Notably, some inhabitants approached the interviewers before the start of the data collection to ask how much they would be paid for participating in the study. In these cases, it was explained that participation was voluntary and that no economic compensation was given to anyone. In general, this situation did not seem to have affected the response rate substantially, as the response rate was generally good
and comparable to those of other face-to-face surveys (34%, see Chapter 3), and, on the occasions when a hard refusal was received, the householder expressed lack of interest rather than disappointment about the lack of monetary compensation.

When the householders agreed to complete the survey, they were introduced to the study objectives and asked about their Internet use. Different questionnaires were designed for users, non-users and ex-users (see Appendix 4 for more details). Most of the questions were closed-ended and selected from many available options used in the research literature about Internet access. The questionnaires started by asking participants about their Internet access and the use of digital technologies at home. Participants who classified themselves as Internet users were asked about their Internet habits, activities and use of the Internet at work. Participants who classified themselves as non-users and ex-users were asked about their reasons for not using the Internet and how that made them feel. They were also questioned about their availability and access to a proxy person who could provide Internet support to them. Ex-users were asked about their activities when they were still using the Internet. All participants (users, non-users and ex-users) were asked about their leisure activities, their attitudes towards the Internet and their contact with family and friends living close and far away. In a final section, socio-demographic information was collected to inquire about participants’ jobs or occupations, age, gender, household size, and postcode. This section was placed at the end of the survey, as suggested by many researchers, to help maintain participants’ interest and avoid possible discomfort from sensitive questions easier to answer once the participant is fatigued at the end of a survey (Albert et al., 2009; Bourque & Fielder, 2002; Colton & Covert, 2007; Dillman, 2007;
Jackson, 2012; Pew Research Center, 2016). Gilovich, Keltner, and Nisbett (2006) have advocated for placing the demographic questions at the end of the survey to avoid the stereotype threats such as being at risk of confirming self-characteristics about one’s social group (Steele & Aronson, 1995). This could lead respondents to answer differently than they usually would have.

Some researchers have also found that inquiring about sensitive information, such as income, can decrease the survey outcomes in several ways, e.g., by reducing the number of participants who are willing to take the survey or by decreasing the response rates or precision on particular items (Tourangeau & Yan, 2007). In the case of socioeconomic variables, the study site contained some neighbourhoods that, according to the English Index of Multiple Deprivation (IMD, 2015), were among the 20-30% most deprived in England (see Map 4). The last “Rural deprivation in Cornwall and the Isles of Scilly: Profile report Pendeen (OCSI, 2009)” also presented supportive data about the vulnerable conditions of the population, with at least 70 people in Pendeen receiving some form of DWP benefit, 54 Pendeen households having no transport, over 17 per cent of the population having a long-term illness that restricts lifestyle, and more than 60 pensioners living on their own. These adverse conditions place the people of the study site as vulnerable based on their socioeconomic status.
Considering these circumstances and comments from one of the key informants who warned about some inhabitants expressing reluctance to share personal information about some of their vulnerabilities, it was decided not to enquire about the respondents’ socioeconomic status. This was also done to maximise the response rate and ensure that the final sample of the survey would be sufficiently large. However, for socioeconomic reference, a question about the job or occupation of the respondents was kept in the survey, as unemployment can be seen as having a severe impact on an individual’s quality of economic and broader social exclusion implications. It should also be noted that while these identity variables were used to build the profiles of the inhabitants
and their access to the Internet, the individual variables alone did not imply a direct specific behaviour (Abdelal et al., 2009).

The questionnaires did not ask for any confidential information that could be used to trace individual responses. However, it asked for the postcode of the participants to understand their distribution between the study site and concerning the physical Internet infrastructure (such as the cabinet and internet exchange). If the participants did not provide their postcode during the interview, the information was estimated through GPS by the interviewee’s location.

5.3.1 Data Preparation and analysis

Data from the questionnaires were captured as .sav and .csv files compatible with SPSS, JASP, and R. The variables were captured using numerical indicators to enable the application of descriptive statistical methods (e.g., means, standard deviations, ranges) and inferential statistical methods (e.g., t-tests, Chi-Squared tests, logistic and linear regression models) to generate profiles of users, non-users and ex-users of the Internet, illustrate their spatial distribution across the study site, and examine how different person variables interact to determine their access to digital technologies.

5.4 RESULTS

The following section will report results from the household survey with a focus on the first-level digital divide to identify individual person variables that are associated with Internet access and to characterise the mechanisms by which these variables interact. Overall, the section is organised into four parts: the first part provides a comprehensive
description of the study sample. The second part develops sociodemographic and spatial profiles of Internet users and non-users. The third part tests for interactions among person variables in predicting Internet use with a particular focus on the role of social support. Finally, the fourth part characterises users and non-users further by examining patterns of ICT-related behaviours in the group of users and the reasons for the lack of Internet use in the group of non-users.

5.4.1 Description of the study sample

Overall, 122 inhabitants of Pendeen participated in the household survey. On most occasions, this was performed as a face-to-face chat to increase the rapport with the respondents and facilitate richer responses than would be captured through open-ended questions. In those cases where time was a clear constraint to provide answers face-to-face, participants received a copy of the survey at their homes or collected it from the Centre of Pendeen. This copy also included the option to add comments.

Gender proportions

From the 122 responded household surveys, 78 participants were female (64% of the study sample) and the remaining 44 participants were male (36% of the study sample).
Figure 14 Proportion of female and male participants

Base: All female (N= 78) and male (N = 44) participants in the study sample.

Age distributions

On average, participants were 59.6 years old (standard deviation (std) = 17.1, range = 17-90). Female participants were slightly younger than male participants (mean age: female = 57.1 years, male = 64.2 years, independent-samples t-test: t = 2.115, p = 0.037). Figure 15 illustrates the age distributions of female and male participants.

Figure 15 Proportion of participants by age distribution

Note: Histogram displaying the age frequency distribution of the whole sample as well as for female and male participants. Note that distributions for female and male participants are overlaid (not stacked), so the count for female participants starts at zero for all data bins. Vertical lines represent the mean of the distributions for female participants (dashed line) and for male participants (dotted line). The asterisk denotes statistical significance of the difference between the distributions of female and male participants (p < 0.05, two-tailed independent samples t-test).

Base: All female (N= 78, mean age = 57.1 years, std = 17.5) and male (N = 44, mean age = 64.2 years, std = 15.8) participants in the study sample. The difference between the age of female and male participants was statistically significant (t = 2.115, p = 0.037).
Occupational status

Out of the 122 participants, 51 were retired at the time of the study (42%), 48 were employed (39%), 16 were unemployed (13%), 4 were students (3%), and 3 declined to report their occupation (2%). As detailed in Chapter 3, relative to population estimates from the 2011 census data, the study sample contained a slight overrepresentation of retired inhabitants, which could be related to the fact that retired people were more likely to be at home or have the availability to engage and participate in this study.

The proportions by occupational status (Figure 16) were very similar for female and male participants. Female participants were slightly more likely than male participants to be employed (43% vs. 36%) or students (5% vs. 0%), and less likely to be retired (38% vs. 49%), whereas the proportion of unemployed participants was almost identical (14% vs. 15%). Consequently, a chi-squared test on the proportions of occupational statuses of female and male participants was non-significant ($X^2 = 3.609, p = 0.462$).
Base: All female (N= 78, employed = 43%, retired = 38%, unemployed = 14%, student = 5%) and male (N = 44, employed = 36%, retired = 49%, unemployed = 15%, student = 0%) participants in the study sample. Differences between the occupational status of female and male participants was non-significant ($X^2 = 3.609$, $p = 0.462$).

The different occupational sub-groups differed systematically in their age: students were younger than all other groups (mean = 23.5, std = 7.5, all independent-samples t-tests > 3.7, all p-values < 0.0016) and retirees were older than all other groups (mean = 73.9, std = 9.3, all independent-samples t-tests > 7.9, all p-values < 0.001). The age of employed participants (mean = 51.3, std = 12.5) and unemployed participants (mean = 49.7, std= 13.3) did not differ significantly (independent-samples t-test = 0.4, $p = 0.678$). Figure 17 shows the age distributions of the different occupational groups of the study sample.
Figure 17 Age distributions of the different occupational sub-groups of the study sample

Note: For each group, the outside of the box describes the interquartile range (i.e., the range within which 50% of the data were located). Black dots within the boxes denote the median of each distribution and whiskers denote 1.5*the Interquartile range. Black dots on the right side of the boxplots denote the age of individual participants within each group.

Base: All employed (N= 48, mean age = 59.9 years, std = 15.9), student (N= 4, mean age = 31.1 years, std = 12.4), unemployed (N= 16, mean age = 49.2 years, std = 15.8), and retired (N= 51, mean age = 52.1 years, std = 16.4) participants in the study sample.

Household size

Participants reported to live in households of varying size from zero up to five additional members. The average number of additional household members was 1.65 (std = 0.93) and did not vary as a function of participants’ gender. The households of male respondents were numerically larger than those of female respondents (male: mean = 1.84, std = 1.09; female: mean = 1.54, std = 0.81), but this difference was not statistically significant (t = 1.698, p = 0.092; see Figure 18).
Figure 18 Distribution of household sizes for the whole sample and for female and male respondents

Note: The distributions for female and male respondents are overlaid (not stacked), so the count for female participants starts at zero for all data bins. Vertical lines represent the mean of the distributions for female participants (dashed line) and for male participants (dotted line). N.S. denotes the lack of statistical significance of the difference between the distributions of female and male participants (p > 0.05, two-tailed independent samples t-test).

Base: All female (N = 78, mean number of other household members = 1.54, std = 0.81) and male (N = 44, mean number of other household members = 1.84, std = 1.09) participants in the study sample. The difference between the household size of female and male participants was non-significant (t = 1.698, p = 0.092).

In contrast, household size clearly varied as a function of age. As illustrated in Figure 19, younger respondents tended to live in larger households, whereas all respondents living on their own were older than 50 years.

Figure 19 Age distributions of participants as a function of their household size

Note: For each household size, the outside of the box describes the interquartile range (i.e., the range within which 50% of the data were located). Black dots within the boxes denote the median of each distribution and whiskers denote 1.5*the Interquartile range. Black dots on the right side of the boxplots denote the age of individual participants within each household size.

Base: All participants without any other household members (N = 12, mean age = 75.1 years, std = 12.6), with one other household member (N = 37, mean age = 66.4 years, std = 12.2), with two other household members (N = 56, mean age = 55.2 years, std = 17.4), with three other household members (N = 10, mean age = 39.7 years, std = 11.8), with four other household members (N = 3, mean age = 63.3, std = 11.1), with five other household members (N = 1, mean age = 52).
5.4.2 Profiles of internet users and non-users

The proportion of users, non-users, and ex-users

Among the 122 participants, 96 classified themselves as Internet users (79% of the study sample), 23 as non-users (19% of the study sample), and the remaining three as ex-users (2% of the study sample).

*Figure 20 proportions of Internet users, non-users, and ex-users within the study sample*

*Base:* All users (N = 96), non-users (N = 23), and ex-users (N = 3) in the study sample.

The responses of the three ex-users showed consistency with the results of other studies (Damodaran et al., 2014; Matthews et al., 2019) that emphasise the lack of skills, age-related changes, and a lack of suitable support as factors that directly influence the (dis-)continuity in their use of Internet and ICTs. The ex-users were 2 females and one male, all three of them living on their own and without any social support that could help them get online or who could encourage them to use the Internet.

The male respondent (76, retired) mentioned that for him, getting disconnected was a ‘natural’ result of ageing, as he required less and less the use of ‘advanced’ technologies while he could perform his day-to-day normal activities without getting online. For the other two ex-users, the female respondents, the situation was less of a ‘choice’ and more
circumstantial. One respondent (female, 43, employed) mentioned giving up her Internet access and not getting a new connection due to security issues. She expressed that when using the Internet in the past she was constantly concerned about the use of her information online and the risk of being scammed. She expressed that at her current work (as a waitress) she was not required to use the Internet, so she was better off without it. The second female respondent, (76, retired) went offline after her husband passed away. In her case, her husband was the one encouraging her to use technology and the main user of the network for work-related activities, so “when he passed away, I didn’t know how to use it and there was also no one else at home who could use it.” In this last case, despite having used the Internet in the past for basic tasks, the respondent gave up after encountering difficulties in keeping up with changing technologies and lacking support when problems arose.

While the interviews provided by ex-users enlightened about some of the reasons experienced in the village by inhabitants who are no longer going online due to the very small number of ex-users, the subsequent quantitative analyses will focus only on Internet users and non-users.

Gender proportions of users and non-users

Small differences were observed in the gender proportions of users and non-users. There were more female than male participants among Internet users (68% female, 32% male), whereas gender proportions were even among the non-users (female = 48%, male = 52%). A chi-squared test on the gender proportions of users and non-users was marginally significant ($X^2 = 3.178, p = 0.075$).
Base: All users (N= 96, female = 68%, male = 32%), non-users (N = 23, female = 48%, male = 52%) of the study sample. The difference between the gender proportions of users and non-users trended toward significance ($X^2 = 3.178$, $p = 0.075$).

Age of users and non-users

Notably, Internet users were considerably younger (mean = 56.4 years, std = 16.4) than non-users (mean = 73.7, std = 13.3) and the group difference was statistically significant ($t = 4.54$, $p < 0.001$).

Base: All users (N= 96, mean age = 56.4, std = 16.3), non-users (N = 23, mean age = 73.7, std = 16.4) of the study sample. The difference between the gender proportions of users and non-users was statistically significant ($t = 4.541$, $p < 0.001$).

**Figure 21 Proportion of female and male participants**

**Figure 22 Age frequency distributions for Internet users and non-users**

Note: The distributions for users and non-users are overlaid (not stacked), so the count for users starts at zero for all data bins. Vertical lines represent the mean of the distributions for users (dashed line) and for non-users (dotted line). Asterisks denote the statistical significance of the difference between the distributions ($p < 0.001$, two-tailed independent samples t-test).
Occupational status of users and non-users

In addition to the age of the respondents, there were also clear differences between users and non-users in terms of their occupational status. The majority of Internet users were employed (46%) or retired (34%) at the time of the survey, while only a minority of participants were unemployed (15%) or students (5%). In contrast, non-users were predominantly retired (74%), and the remaining participants were split into equal-size groups of employed and unemployed participants (both 13%). There were no students among the non-users. Consequently, a chi-squared test on the proportions of occupational statuses of users and non-users was significant ($X^2 = 14.152$, $p = 0.007$; see Figure 23 for illustration).

*Figure 23 Proportion of different occupational statuses of Internet users and non-users*
Household size of users and non-users

Users and non-users of the Internet also differed in their household sizes. As shown in Figure 24, users lived with significantly more additional household members (mean = 1.75, std = 0.77) than non-users (mean = 1.22, std = 1.35; t = 2.534, p = 0.0065).

Figure 24 Frequency distributions of the number of other household members for Internet users and non-users

Note: The distributions for users and non-users are overlaid (not stacked), so the count for users starts at zero for all data bins. Vertical lines represent the mean of the distributions for users (dashed line) and for non-users (dotted line). Asterisks denote the statistical significance of the difference between the distributions (p < 0.01, two-tailed independent samples t-test).

Base: All users (N = 96, mean number of other household members = 1.75, std = 0.75), non-users (N = 23, mean number of other household members = 1.22, std = 1.35) of the study sample. The difference between the gender proportions of users and non-users were statistically significant (t = 2.534, p = 0.007).

Internet use in the households of users and non-users

Beyond their size, the households of Internet users and non-users also differed markedly in the level of engagement with the Internet. Whereas the majority of users reported that all other household members were using the Internet (59%), the vast majority of non-users reported that none of the other household members were Internet users (93%). Consequently, a chi-squared test on the proportions of Internet users in the households of users and non-users was highly significant ($X^2 = 84.897$, p < 0.001; see Figure 25 for illustration).
Base: All users (N = 96, all other members = 59%, some other members = 7%, no other members = 34%), non-users (N = 23, all other members = 0%, some other members = 7%, no other members = 93%) of the study sample. The difference between the proportions of household users were statistically significant ($X^2 = 84.897, p < 0.001$).

Location of users and non-users within the study site

As shown below in Figure 26, both users and non-users were widely distributed throughout the whole study site without clear spatial differentiation. As illustrated in Figure 27, the proportion of users was highest in the Carnyorth or Calartha (both 100%), intermediate in hamlets of Morvah, Pendeen, and Bojewyan (all 80%), and lowest in Bottalack (64%) and Trewellard (70%).

Figure 25 Proportion of Internet users in the households of users and non-users
Figure 26 Spatial distribution of Internet users, non-users and ex-users across the study site
Figure 27 Proportion of Internet users, non-users and ex-users by hamlet

**Base:** All users (N=96) and non-users (N=23), and ex-users (N=3) of the study sample. Proportions of user types in the different hamlets: Bottalack (users = 64%, ex-non-users = 27%, users = 9%), Carnyorth (users = 100%), Bojewyan (users = 80%, non-users = 20%), Calartha (users = 100%), Morvah (users = 80%, non-users = 20%), Pendeen (users = 80%, non-users = 18%, ex-users = 2%), Trewellard (users = 70%, non-users = 26%, ex-users = 4%).

### 5.4.3 Interactions among predictor variables: the role of social support

After establishing descriptive profiles of Internet users and non-users, a series of regression analyses were conducted to understand in more detail how different person variables were interacting to create individual differences in Internet use. Based on the results of the Rapid Assessment, a particular focus of this analysis was on the effects of the level of social support that was available to participants. As detailed in Chapter 4, the
Rapid Assessment suggested that the presence or absence of support with digital technologies was often a critical variable mediating the link between motivation and actual use. Accordingly, the current set of analyses aimed to test if the level of available social support from Internet-proficient contacts could provide an effective resource to facilitate access to digital technologies and mitigate the negative effects of other person variables that were otherwise associated with reduced Internet use.

Initially, the analyses aimed to establish if individual differences in social support constitute a reliable predictor of concurrent differences in Internet use. To this end, different regression models were fit to identify the best predictors among the person variables (i.e., those variables that explain unique variance in Internet use). Internet use was operationalised in two different ways: firstly, as a categorical variable (reflecting the binary statuses of “user” and “non-user”), and, secondly, as a metric variable (reflecting quantitative differences in the amount of Internet use between participants). The latter variable was calculated by aggregating participants’ answers to items QU5 a-j, see Chapter 3 and Appendix 4). Internet user statuses were predicted with logistic regression models, whereas the amount of Internet use was predicted with linear regression models.

Participants’ level of social support was also operationalised in two different ways: firstly, the reported number of Internet users at home was considered as an index of the availability of social resources specifically related to Internet use. Secondly, the reported number of social contacts was considered as a general index of participants’ social network size. The rationale for operationalising social support in two different ways was
to provide a means for validation that potential effects reflect the availability of social support (and not the effects of some correlated variable). This variable was calculated by aggregating items QU 18a-e (see Chapter 3 and Appendix 4).

The effects of social support on Internet use were evaluated against the following competing predictor variables: age, gender, household size, and employment status (this variable was recoded into a binary variable indicating whether or not participants were employed at the time of the study). The previous analyses revealed that users and non-users of the Internet differ significantly in all of these variables. The regression analyses aimed to test which of these variables are uniquely predictive of Internet use and which variables are redundant in this respect.

To evaluate the usefulness of social support as a predictor of Internet use, two additional variables were calculated reflecting participants’ Internet-related attitudes and skills. Previous research has documented that Internet-related attitudes and skills are both very strong predictors of Internet use (Iver & Eastman, 2006; Wu & Tsai, 2006; van Dijk, 2005). Internet attitudes were estimated by aggregating items QU16a-g and items QU17a-k (see Chapter 3 and Appendix 4). Items assessing negative attitudes were reverse-coded so that higher scores would index more positive attitudes toward the Internet. Self-reported Internet skills were computed as respondents’ answers to the item QU4 (see Chapter 3 and Appendix 4). The motivation to include attitudes and skills in the analyses was twofold: firstly, by including these variables as predictors, it aimed to test if potential effects of social support survive even in the presence of very strong competitors. Secondly, by examining interaction effects, it provided a window to test the hypothesis that social support can
mediate the effects of other predictor variables (e.g., negative attitudes or low technology skills).

Notably, after evaluating the general use of social support as a predictor of Internet use, the second set of regression analyses was conducted to test the putative compensatory role of social support in alleviating the adverse effects of other variables. This was conducted by testing for significant statistical interactions between the effects of social support and the impact of other significant predictor variables.

5.4.3.1 Predicting Internet User Status

The first analysis aimed to identify variables that reliably could predict whether or not a participant reports to be a user of the Internet. To this end, a logistic regression model was fit using self-reported user status (user vs. non-user) as dependent variable. The following predictor variables were included: attitudes, age, gender, employment status, household size, and social support (defined via the number of Internet users in the household). Internet-related skills were not included as a predictor variable in this analysis, as non-users of the Internet would all report the lowest possible level of skills. Hence, this variable would, by definition, perfectly discriminate between users and non-users without providing any analytic insight. By contrast, the variable was included in the subsequent analyses that aimed to predict the amount of Internet use. In this case, the level of Internet-related skills provides relevant (and non-trivial) information about participants that can be used to gain insights about the mechanisms that underlie differences in Internet use.
Predictors were entered simultaneously to the model, so they were competing to explain variance in the dependent variable, and significant regression coefficients reflect unique statistical effects.

Overall, this model explained 47% of the variance in participants user status reports. Two effects were statistically significant: attitudes ($z = 3.506, p < 0.001$) exhibited a positive effect, indicating that more positive attitudes are predictive of a higher probability of being an Internet user. Social support exhibited a positive effect ($z = 2.042, p = 0.041$), indicating that higher levels of social support were predictive of a higher probability of being an Internet user. The effect of gender was at trend level ($z = 1.650, p = 0.085$), indicating that female subjects tended to be more likely to be users of the Internet. In contrast, the effects of age, employment status, and household size were all non-significant (all $z < 1.100$, all $p > 0.310$), suggesting that they carried no unique predictive value in explaining Internet use (see Table 1). Please note that each of these variables was a highly significant predictor of Internet user status when considered individually. Hence, the fact that their effects were no longer significant in the competitive regression model suggests that their effects can be accounted for by some of the other predictor variables with significant effects.
Table 1. Logistic regression model with main effects only predicting Internet user status (social support operationalised via the number of Internet users at home)

<table>
<thead>
<tr>
<th>Predictor Variable</th>
<th>Standardised Regression Coefficient</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitudes</td>
<td>3.506</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Age</td>
<td>0.769</td>
<td>0.442</td>
</tr>
<tr>
<td>Gender</td>
<td>1.650</td>
<td>0.085</td>
</tr>
<tr>
<td>Employment</td>
<td>1.012</td>
<td>0.312</td>
</tr>
<tr>
<td>Household Size</td>
<td>0.350</td>
<td>0.726</td>
</tr>
<tr>
<td>Social Support</td>
<td>2.042</td>
<td>0.042</td>
</tr>
</tbody>
</table>

Base: The analyses are based on all users (N= 96) and non-users (N = 23) of the study sample.

Importantly, the same pattern of results was obtained when social support was operationalised via participants social network size (see above for details). Overall, this model explained 45% of the variance in participants user status reports. There were significant effects of attitudes ($z = 3.417$, $p < 0.001$), and social support ($z = 2.252$, $p = 0.024$), and non-significant effects of all other predictor variables. Together, these results are consistent with the idea that the level of social support represents an important individual person variable that carries unique value in predicting whether or not a person considers themselves a user of the Internet (see Table 2).
Table 2. Logistic regression model with main effects only predicting Internet user status (social support operationalised via the number of social contacts nearby)

<table>
<thead>
<tr>
<th>Predictor Variable</th>
<th>Standardised Regression Coefficient</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitudes</td>
<td>3.417</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Age</td>
<td>1.093</td>
<td>0.274</td>
</tr>
<tr>
<td>Gender</td>
<td>0.587</td>
<td>0.557</td>
</tr>
<tr>
<td>Employment</td>
<td>0.827</td>
<td>0.408</td>
</tr>
<tr>
<td>Household Size</td>
<td>1.682</td>
<td>0.092</td>
</tr>
<tr>
<td>Social Support</td>
<td>2.252</td>
<td>0.024</td>
</tr>
</tbody>
</table>

**Base:** The analyses are based on all users (N = 96) and non-users (N = 23) of the study sample.

Lastly, to test if the level of social support influences the effects of other reliable predictor variables (see above), the regression models were amended by an interaction term between the level of social support and Internet-related attitudes.

When social support was operationalised by the number of Internet users at home, a significant interaction term was observed for attitudes (z = 2.212, p = 0.027, see Table 3). To examine the nature of this interaction, separate regression models were fit for those participants without any Internet users at their households (N = 57) and those participants with at least some Internet users at their households (N = 62). For participants without Internet users at home, attitudes were a reliable predictor of Internet user status (z = 4.137, p < 0.001). By contrast, in participants with at least some Internet users at home the same effect was non-significant (z = 1.06, p = 0.370), suggesting that
the availability of social support can weaken the link between attitudes about the Internet and the probability of its use.

Table 3. Logistic regression model with interaction effects predicting Internet user status (social support operationalised via the number of Internet users at home)

<table>
<thead>
<tr>
<th>Interaction term</th>
<th>Standardised Regression Coefficient</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitudes * Social Support</td>
<td>2.212</td>
<td>0.027</td>
</tr>
</tbody>
</table>

**Base:** The analyses are based on all users (N = 96) and non-users (N = 23) of the study sample.

When social support was operationalised via the size of participants’ social networks, the same pattern of results was obtained. The level of social support interacted significantly with attitudes ($z = 1.960$, $p = 0.049$, see Table 4). To examine the natures of the interaction effect, separate regression models were fit for participants with large vs. small social networks (defined by a median split of the social network variable). For participants with small social networks, attitudes ($z = 4.209$, $p < 0.001$) were a strong predictor of Internet user status. By contrast, for participants with large social networks, the effects of attitudes were non-significant ($-1.660$, $p = 0.108$).

Table 4. Logistic regression model with interaction effects predicting Internet user status (social support operationalised via the number of social contacts nearby)

<table>
<thead>
<tr>
<th>Interaction term</th>
<th>Standardised Regression Coefficient</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitudes * Social Support</td>
<td>1.960</td>
<td>0.049</td>
</tr>
</tbody>
</table>

**Base:** The analyses are based on all users (N = 96) and non-users (N = 23) of the study sample.
Collectively, these results support the hypothesis that the level of social support represents an important person variable that affects the likelihood of engaging with the Internet and can mitigate the negative impact of well-established factors such as old age and negative attitudes about the Internet.

5.4.3.2 Predicting the Amount of Internet Use

The second set of regression analyses aimed to establish whether or not the aforementioned effect of social support predicts not only qualitative but also quantitative indicators of Internet use. This would suggest that social support is relevant not only for overcoming general obstacles with regard to getting connected (e.g., becoming aware of useful online resources, gaining access to relevant devices, or learning how to use them effectively) but also for the quality and depth of Internet-related activities. To evaluate this question, a linear regression model was fit to the data using a metric variable of Internet use as dependent variable (see above for details) and the same predictor variables as in the foregoing logistic regression analyses with the addition of Internet-related skills.

When social support was operationalised by the number of Internet users at home, the model explained 43% of the variance in the amount of participants Internet use. There were four significant effects (see Table 5): the first was a negative effect of age (\( t = -3.337, p = 0.001 \)), indicating that higher age was predictive of a lower amount of Internet use. Significant positive effects of attitudes (\( t = 5.400, p < 0.001 \)) and skills (\( z \))
= 3.867, p < 0.001) indicated that more positive attitudes and higher level of skills were predictive of a larger amount of Internet use. Finally, there was a positive effect of social support (t = 1.998, p = 0.031), indicating that a higher level of social support was predictive of a larger amount of Internet use. The remaining effects were all non-significant (all t < 0.610, all p > 0.540).

Table 5. Linear regression model with main effects only predicting the amount of Internet use (social support operationalised via the number of Internet users at home)

<table>
<thead>
<tr>
<th>Predictor Variable</th>
<th>Standardised Regression Coefficient</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitudes</td>
<td>5.400</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Age</td>
<td>-3.337</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Skills</td>
<td>3.867</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Gender</td>
<td>0.610</td>
<td>0.540</td>
</tr>
<tr>
<td>Employment</td>
<td>0.448</td>
<td>0.683</td>
</tr>
<tr>
<td>Household Size</td>
<td>0.602</td>
<td>0.548</td>
</tr>
<tr>
<td>Social Support</td>
<td>1.998</td>
<td>0.031</td>
</tr>
</tbody>
</table>

**Base:** The analyses are based on all users (N= 96) and non-users (N = 23) of the study sample.

Interestingly, the pattern of results slightly changed when social support was operationalised via participants' social network size (see above for details). This model explained 49% of the variance in the amount of participants' Internet use, and there were now five significant effects (see Table 6): the effects of age (-3.567, p < 0.001), attitudes (t = 5.553, p < 0.001), and skills (z = 3.824, p < 0.001) were virtually unaffected. There was an even stronger effect of social support (t = 4.007, p < 0.001), indicating that social network size was more closely related to the amount
of Internet use than the number of Internet users in the household. Finally, the effect of household size was significant too in this model \((t = 2.572, p = 0.011)\), indicating that larger households were predictive of higher amounts of Internet use.

Table 6. Linear regression model with main effects only predicting the amount of Internet use (social support operationalised via the number of social contacts nearby)

<table>
<thead>
<tr>
<th>Predictor Variable</th>
<th>Standardised Regression Coefficient</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitudes</td>
<td>5.553</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Age</td>
<td>-3.567</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Skills</td>
<td>3.824</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Gender</td>
<td>0.547</td>
<td>0.622</td>
</tr>
<tr>
<td>Employment</td>
<td>0.788</td>
<td>0.493</td>
</tr>
<tr>
<td>Household Size</td>
<td>2.572</td>
<td>0.011</td>
</tr>
<tr>
<td>Social Support</td>
<td>4.007</td>
<td>0.031</td>
</tr>
</tbody>
</table>

Base: The analyses are based on all users \((N= 96)\) and non-users \((N = 23)\) of the study sample.

Lastly, to test more directly if the level of social support influences the impact of other reliable predictor variables (i.e., attitudes, skills, and age) on the amount of Internet use, the regression models were amended by including interaction terms between the level of social support and the other significant predictors variables.

When social support was operationalised by the number of Internet users at home, significant interaction terms were observed for attitudes \((t = 2.552, p = 0.012)\), skills \((t = 2.214, p = 0.033)\), and age \((z = -2.054, p = 0.042, \text{see Table 7})\). To examine the nature of these interaction effects,
separate regression models were fit for participants without Internet users at their homes and for participants with at least some Internet users at home. For participants without Internet users at home, attitudes ($t = 6.269, p < 0.001$), age ($t = 3.325, p = 0.002$), and skills ($t= 3.614, p < 0.001$) were all very strong and predictors of Internet user status. In participants with at least some Internet users at home, the effects of attitudes ($t = 2.513, p = 0.015$), age ($t= 2.391, p = 0.020$), and skills ($t= 2.411, p = 0.019$) were still significant but markedly reduced in magnitude.

Table 7. Linear regression model with interaction effects predicting the amount of Internet use (social support operationalised via the number of Internet users at home)

<table>
<thead>
<tr>
<th>Interaction term</th>
<th>Standardised Regression Coefficient</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitudes * Social Support</td>
<td>2.552</td>
<td>0.012</td>
</tr>
<tr>
<td>Skills * Social Support</td>
<td>2.214</td>
<td>0.033</td>
</tr>
<tr>
<td>Age * Social Support</td>
<td>2.054</td>
<td>0.042</td>
</tr>
</tbody>
</table>

**Base:** The analyses are based on all users (N= 96) and non-users (N = 23) of the study sample.

When social support was operationalised via the size of participants’ social networks, a very similar pattern of results was obtained. The level of social support interacted with attitudes ($z = 2.225, p = 0.016$), and skills ($z = 2.031, p = 0.045$), but not with age ($z = 0.526, p =0.600$). To examine the natures of these interaction effects, separate regression models were fit for participants with large vs. small social networks (defined by a median split). For participants with small social networks, attitudes ($z = 6.549, p < 0.001$), skills ($z = 5.467, p < 0.001$), and age ($5.169, p < 0.00$) were all strong predictors of Internet user status. For participants with large social networks, the effects of attitudes ($-3.451, p = 0.001$), skills ($z$
Collectively, these results support the hypothesis that the level of social support affects not only the likelihood of engaging with the Internet, but also the quality and depth of this engagement, and that it can mitigate the negative impact of other factors, especially negative attitudes and low level of Internet-related skills.

5.4.4 Characterisation of internet users and non-users

After identifying key individual person variables that determine differences in Internet use, and describing mechanisms by which they may interact, the final analysis section aimed to characterise the groups of Internet users and non-users in more detail, based on the available survey data. This was done by collating the types of activities for which users were accessing the Internet, and the reasons non-users reported for not engaging with it.

5.4.4.1 Characterisation of Users

Duration of Internet Connections at Home

Within the group of Internet users, there was a wide range in the time for which the households had been connected to the Internet. Roughly equal proportions of users reported being connected for 1-5 years (26%), 6-10 years (41%) or more than 10 years (30%). Notably, only a very small proportion of users had acquired their connection very recently within the last year (3%).
Figure 28 Proportion of time for which the households of Internet users had been connected to the Internet

Base: All users (N= 96) of the study sample. Proportion of time for which households had been connected to the Internet: less than a year = 3%, 1-5 years = 26%, 6-10 years = 41%, more than 10 years = 30%.

Locations of Internet Use

The group of Internet users reported getting connected at a variety of different locations. Most of the users reported using the Internet at home (99%) at another person’s home (65%) or at work (45%), though a considerable proportion of participants also reported getting connected in public and semi-public places such as Community Centres (26%), Libraries (21%), Internet Cafés or at Schools or Universities (both 9%). These results are consistent with the Rapid Assessment from study phase 1 (see Chapter 4) and underscore the importance of public places in providing access to new technologies to the inhabitants of disadvantaged rural areas (see Chapter 6 for a detailed analysis).
Use of Mobile Phones among Internet users and non-users

In the UK, since 2018, at least 95% of adults report using a mobile phone, and at least 72% use their devices to access the Internet (Ofcom, 2020). Mobile phones are seen as an important tool to bridge digital exclusion (Tinder Foundation, 2015). For example, in the UK, by 2011, the Digital Engagement Team from the Government Digital Service Office, UK assumed that providing access to Internet-mediated messaging would have an important role in bridging the digital divide, helping traditional non-users to approach the digital world by using a device that they already know and trust.

To explore the extent to which mobile phones might serve as facilitators to Internet access and use, the survey asked participants to report whether or not they use their mobile phones to perform different types of activities. As shown in Figure 33, Internet users reported using their
mobile phones to perform a variety of Internet-related activities such as phone calls (100%), text messages (86%), Email (56%), sending of photos (56%), browsing the Internet (52%), using applications (49%), finding directions (45%), posting photos and/or videos (44%), listening to music (28%) and playing games (22%). By contrast, even though all of the non-users had access to a mobile phone, they reported using it only for very basic tasks, namely phone calls (100%) and text messages (50%). A single non-user reported using the mobile phone also for sending emails and photos. These results clearly suggest that access to mobile phones alone did not facilitate Internet use in the current sample and that additional barriers must be overcome.

Figure 30 activities for which Internet users (black bars) and non-users (grey bars) used their mobile phones

Base: All users (N= 96) and non-users (N= 23) of the study sample. Proportion of mobile-phone use for different activities: phone calls (users = 100%, non-users = 100%), text messages (users = 86%, non-users = 50%), email (users = 56%, non-users = 4%), sending photos (users = 56%, non-users = 4%), browse Internet (users = 52%, non-users = 0%), use applications (users = 49%, non-users = 0%), find directions (users = 45%, non-users = 0%), social networks (users = 44%, non-users = 0%), posting photos/videos (users = 42%, non-users = 0%), listen to music (users = 28%, non-users = 0%), play games (users = 22%, non-users = 0%).

Note: Bars display the proportion of participants within each group that report using the phone for a given activity.
5.4.4.2 Characterisation of Non-Users

Reasons for Internet non-use

The survey also asked non-users about their reasons for not engaging with the Internet. Non-users reported a variety of reasons; the most common one that was shared by most participants within this group was a lack of interest (78%), followed by a lack of necessary equipment such as personal computers (65%) or Internet connections at home (43%). Many non-users also reported a perceived lack of skills, reflected in agreement with the statements that the Internet is “not for me” (39%), “not for my age” (35%), and “too difficult” (35%), or that the content available on the Internet was deemed “not interesting” (30%) or “not useful” (26%). Interestingly, concerns about the financial costs (26%), lack of privacy (13%), or spam/viruses (4%) were the least frequent reasons not to engage with the Internet.

Figure 31 Non-users’ reasons not to engage with the Internet

Note: Bars indicate the percentage of non-users that report a given reason in descending order.

Base: All non-users (N= 23) of the study sample. Proportion of non-users reporting reasons not to engage with the Internet: no interest (78%), no computer (65%), no connection (43%), not for me (39%), not for my age (35%), too difficult (35%), no interesting content (30%), not useful (26%), too expensive (26%), lack of know-how (16%), no privacy (9%), no time (4%), spam/viruses (4%).
Future Plans

Non-users were also asked about their intentions to get a Broadband connection or any form of Internet access within the next year. Remarkably, nearly all of the non-users reported that were certain not to seek to obtain a Broadband connection (91%) or other forms of Internet access (87%), while the remaining non-users declined to answer. In other words, not a single non-user expressed concrete plans to obtain an Internet connection in the future.

5.5 CONCLUSIONS

This chapter presented the results from a household survey on the analysis of the first level of the digital divide in the Cornish village of Pendeen.

The first level of the digital divide refers to constraints in the access to ICTs and the Internet. As discussed in detail in Chapter 2, the first level of the digital divide has been largely associated with a socioeconomic gap between those who have access to a computer and the Internet and those who do not. This binary view is also the most widespread notion to refer to the digital divide in general.

The research on the first level of the digital divide has established that users and non-users of the Internet typically differ along a number of socio-demographic variables. For example, non-users have been documented to be older, less educated, and more likely to be retired, unemployed or on a low income (Hoffman et al., 2000; Mossberger et al., 2003; Robinson et al., 2015). Findings along those lines are typically
thought to reflect the unequal division of socioeconomic resources that
determine who will have access to the Internet and who will not.
Consequently, providing more widespread technological access has
been the predominant strategy to favour digital inclusion.

While this approach to the digital divide has been criticised for reducing
the problem of digital inequality to economic inequality (van Deursen and
van Dijk, 2019; Helsper, 2012; Hargittai, 2002), understanding differences
in the structural access to the Internet remains an important concern
because it is a first step to track how the distribution of the material
network contributes to the maintenance or the deepening of an uneven
geographical coverage. This holds true, especially for disadvantaged
areas that generally present poor coverage and a high proportion of non-
users relative to urban areas. This chapter presents an attempt to observe
what lies in the “data shadows” of one disadvantaged territory that could
not be captured through the analysis of large-scale (national level) data
sets. To this end, an extensive face-to-face household survey was
conducted, in the course of which every house in the study site was
approached on several occasions. The personal collection of data was
intended to maximise the response rate and data quality and to obtain
metadata that could potentially enrich the information from open-ended
responses. While it is clear that the resulting study sample was not fully
representative of the local population, it should be noted that it was
nonetheless much larger and more diverse than those of previous studies
focusing on Internet use in local disadvantaged areas (Correa & Pavez,
2016; Reisdorf et al., 2012; Williams et al., 2016), permitting more
detailed analyses and conclusions about factors shaping the digital
divide.
The results presented in this chapter replicate some of the findings from the existing literature on the first level of the digital divide. For example, non-users of the Internet were older than users, less likely to be employed and more likely to be retired or unemployed (Blank & Grošelj, 2014; Zillien & Hargittai, 2009). Even though no information about participants’ income or other indicators of their socioeconomic status was collected to avoid stigmatisation and minimise the dropout rate, these findings nonetheless suggest that at least some of the socio-economic forces that constrain access to ICTs are similar for rural and urban environments. As detailed in the description of the Rapid Assessment, the population of Pendeen presented a high proportion of inhabitants on a low income and receiving benefits. One key informant therefore advised that collecting socioeconomic data might demotivate participation. In addition to those sociodemographic variables, the current study also replicated the critical role of attitudes and skills in determining access to and use of the Internet. Interestingly, attitudes and skills appeared to be more closely related to actual Internet use than purely demographic indicators. For example, the effects of age and employment, which were both substantial if these variables were considered individually, became non-significant in several competitive regression models. This suggests that sociodemographic markers such as old age or unemployment do not affect a person’s technology use directly but rather processes that are correlated with these markers (e.g., reduced self-efficacy, smaller social networks, or economic constraints) that may in turn limit their skills and promote more negative attitudes. Future research would benefit from better conceptualisations and empirical tests of such mechanisms.

Beyond affirming links between Internet use and established individual person variables, the current study also tested and supported the idea
that a person’s level of social support determines their access to the Internet above and beyond the effects of the aforementioned factors. In the current study, the level of available social support predicted both the probability of engaging with the Internet and the number of activities for which it is used. Perhaps even more importantly, the level of social support interacted with the impact of other variables such as age, attitudes, or the level of Internet-related skills. These results suggest that even well-established links between person variables and Internet use are not fixed but can change substantially depending on the person’s life context and the availability of potentially compensatory resources. For example, old age or a low level of Internet-related skills were mainly predictive of technology use in those participants who lacked social contacts in their proximity but not in those who were embedded into larger social networks and therefore likely had support available to them. The idea that different forms of disadvantage are not independent of one another but can interact in complex (non-additive) ways is at the heart of intersectional theories of inequality which emphasise that challenges experienced by individuals reflect the interplay of different forms of discrimination that cannot be reduced to separate simpler forms of inequality (Crenshaw, 1989).

These current results imply that empirical research on the digital divide should attempt to better account for such interactions and consider the social context of Internet use more closely. Notably, existing theories of the digital divide have already incorporated the idea that social contacts provide a valuable resource that can be leveraged to obtain benefits in the digital world, which is typically summarised under the construct of “social capital” (e.g., Ragnedda & Ruiu, 2017; Helsper, 2012). Nonetheless, empirical studies rarely consider the role of social support
in mediating access to digital technologies (see Reisdorf et al., 2020, for a notable exception). The same holds for intervention studies aiming to increase Internet access and use in disadvantaged populations. These studies target individuals by providing technology access in community centres. By teaching individuals basic skills required to use technologies such as ITCs, they hope this will ultimately lead to diverse and long-lasting patterns of technology use (e.g. Melgaço & Willis, 2017; Willis, 2019). However, the current results suggest that interventions in structurally disadvantaged areas would likely be more effective in bringing about sustainable change if they could engage or create local, sustainable networks of collaboration to provide individuals with available support to overcome obstacles and develop and maintain patterns of technology use that can genuinely facilitate their lives (see Servon, 2002 and Newholm et al., 2008 for a similar perspective).

Notably, while the current results provide clear and coherent evidence for an essential role of social support in shaping access to the Internet, they cannot reveal what forms the nature of this support can take. The analyses presented in this chapter merely established that the level of available social support is predictive of individual differences in Internet use, leaving it open to what kind of social contacts are engaged and what aspects of technology use they facilitate. These critical questions will be addressed in the subsequent chapters through qualitative analyses of reports from individual inhabitants and systematic observations about the patterns of life in the community of Pendeen and the role of technology use therein.

Another noteworthy observation in the current study was a gender effect, whereby female participants were more likely to be Internet users than
male participants. At first glance, this finding is surprising, given that previous research has typically documented either no gender differences at all in Internet use or gender effects in the opposite direction (Bimber, 2000; van Deursen and van Dijk, 2019; Ferro, 2005). Notably, the gender effect only reached trend level in the regression analysis, so it remains an open issue whether the observed difference reflects a genuine effect of gender or a masked effect of other correlated variables. Nonetheless, as discussed in Chapter 7, the observation of participants within the study site suggested that male and female participants were receiving differential levels of social support, which affected their engagement with ICTs. As noted above, for the variables of age and employment, gender is unlikely to influence Internet use directly. Differences between male and female respondents should be attributed to associated socio-cultural differences (e.g., differential role expectations regarding technology use or different size and composition of social networks, or different motivations and skills to use the Internet).

Interestingly, previous research has shown that women tend to use the Internet more than men for social purposes (Buchi et al., 2016), which may relate to the fact that women have historically occupied roles in society that emphasise the management of social relationships (Hofstra et al., 2017). Further evidence suggests that gender differences in Internet use are across the lifespan due to changing life circumstances and are most pronounced when new family obligations reinforce traditional gender roles and divisions of labour (Helsper, 2010). Understanding the nature, origin, and consequences of gender differences in Internet use, therefore, requires careful consideration of socio-cultural mechanisms (ideally in longitudinal study designs).
Remarkably, all Internet non-users within the current study owned a mobile phone. In other words, they were, in principle, able to use the Internet through a mobile connection. Nonetheless, they exhibited a complete lack of interest in Internet-related activities. They did not use their mobile phones except for essential activities: phone calls and text messages. Furthermore, not a single non-user in the study expressed concrete plans to get an Internet connection. Their responses were diverse when asked about the reasons for not engaging with ICTs: most non-users reported a lack of interest and suitable technological devices as the primary reason. However, a considerable number of non-users also referred to their lack of relevant skills and knowledge and concerns about the costs and the lack of privacy of online activities. Standalone survey data underscore that structural access to the Internet and ownership of ICTs are insufficient to explain digital inclusion, posing a great challenge for any digital engagement initiative. Despite overcoming material access limitations, individuals may be reluctant to go online for personal, social, and cultural reasons. Understanding these reasons in more detail requires considering participants’ sociocultural and historical context, which will be the focus of the subsequent chapters.
Chapter 6. The history of an ex-mining village and its impact on infrastructure and social dynamics
6.1 INTRODUCTION

The previous chapter examined individual differences in Internet use among the inhabitants of the study site as a function of different person variables. The current chapter will take a complementary perspective by examining how the area’s historic and economic development as a rural mining area and its current state as a conservation site have shaped people’s access to new technologies. To this end, the chapter analyses how the area’s developments have imposed different constraints (structural and social) impacting people’s access to and valuation of different infrastructures including the Internet. In addition, the chapter goes a step forward by examining if and how social interaction in public and semi-public places (third places), can facilitate access to digital technologies.

Overall, the chapter is structured as follows: Section 6.2 provides an overview of the tin coast and its current status as conservation areas in which the study site is encompassed. Section 6.3 builds upon this overview to analyse how the remains of the mining industry have impacted the current structure of the rural neighbourhoods and describe the role of third places within each neighbourhood. Section 6.4 then examines the socio-cultural dynamics unfolding within this territory, differentiating social groups and describing their patterns of life and the role of digital technologies therein. The final section 6.5 synthesises and discusses the most important findings.

6.2 A CONSERVATION AREA: THE HISTORIC TIN COAST

As noted previously, Pendeen is composed of seven neighbourhoods. These neighbourhoods, including the urban centre of Pendeen, were
developed during the rise of the mining industry in Cornwall in the 18\textsuperscript{th} century, as part of the town and Civil Parish of St Just-in-Penwith, originally the centre of the tin mining industry in the Southwest of Cornwall. Nowadays, because of the important remains of the mining industry, this part of Cornwall has been recognised as a significant historic conservation area, which has defined the structural immutability of some of its settlements.

Pendeen is part of the Cornwall and West Devon World Heritage Site, recognised in 2006 for its ‘outstanding universal value’. As a Cultural World Heritage region, it consists of 10 distinct areas that have been identified as the most historically significant surviving components of the Cornwall and West Devon metal mining landscape, comprising the period from 1700 to 1914. These areas are thought to have had a profound impact on the growth of industrialisation in the United Kingdom and consequently on industrialised mining around the world until the 20\textsuperscript{th} century.

Pendeen sits within the St Just Mining District in the historic Tin Coast (see Map 5, ‘A1’), defined by the Cornish mining industry, with ruined engine houses and chimneys framing the landscape. It stretches approximately seven miles from Pendeen lighthouse in the north to Cape Cornwall (St Just) and the valleys to the south. The Tin Coast includes three National Trust hubs: Botallack, Cape Cornwall and Levant Mine and Beam Engine, famous worldwide for their tin and arsenic extraction, and for having the only working beam engine in its original site.
Nowadays, nature has recovered those cliffs, and the remains of the mines are mostly used as refugees for the local fauna, such as the Peregrine Falcons and the Cornish Choughs. At the same time, cattle can be seen grazing freely around some of the most important remains of the mining past (Image 3).

*Image 3 Chimneys bordering the landscape*
In the following subsection, the three National Trust hubs that sit within the St Just Mining District will be described:

**Cape Cornwall**

Going beyond the boundaries of the initial study site, Cape Cornwall marks the spot where the Atlantic currents divide. It was bought by H. J. Heinz Company for the nation as part of their centenary celebrations and presented to the National Trust in 1987. The chimney stack dates back to 1894, when Cape Cornwall Mine (Image 4) was in operation, extracting tin and copper from under the sea. From Cape Cornwall, there are numerous scenic walks to discover Sennen Cove in the south or up on the Tin Coast path through north to the Pendeen Lighthouse.

*Image 4 Cape Cornwall*

**Botallack**

Botallack was a submarine mine, with its workings reaching half a mile out under the seabed. It produced roughly 14,500 tonnes of tin, 20,000 tonnes of copper and 1,500 tonnes of refined arsenic. In the very early
1800s, a pumping engine was set up at the base of the cliffs to pump out workings developing under the sea from the lower levels of the old Wheal Button to the north (‘Wheal’ is the Cornish term for ‘mine’ or ‘work’). It was successful and was later replaced by the current lower engine house.

The best known of the engines of the Botallack mines are the Crowns engine houses, which were built around 1815 (Image 5) to pump water and thereby enable submarine mining. To reach the copper lode, seven by 4 feet tunnels were cut over a mile out under the sea. The shafts were sunk to a depth of 350 fathoms.

The count house, common features of most 19th century mines that provided office space for the purser and his managerial staff (National Trust, 2017a), is another of Botallack’s distinctive elements. It was built around 1861 when the main produce of the mine was shifting from copper to tin, a more profitable product. Mining stopped at Botallack in 1895 when the Penzance School of Mines took over the count house as a school of mine surveying. It was opened again and reworked in 1906-

![Image 5 Crown engine houses](image-url)
1914 from Allen’s Shaft, and the Count House reverted once again into the mine office. Commencing the start of the war in 1914, the building became a private house, hosting a folk club, disco and restaurant until it came into National Trust ownership in 1995. It is now rented accommodation, and the count house has been converted into a holiday cottage.

**Levant Mine and beam engine**

Levant Mine, previously mentioned in 0 is located within the Tin Coast Path and extends over a mile out under the seabed. It produced 130,000 tons of copper from 1820 to 1930 (National Trust, 2017b), making it one of the major copper producers until tin overtook the mining industry. Copper, tin and arsenic (a lucrative but deadly by-product of the tin ore) were mined here for generations. Levant Mining Company was constituted in 1820, though Levant Mine (Image 7) first appeared on a map in 1748, and the vestiges show shallow mine workings from the 17th century at the site.

*Image 7 Levant mine*
6.3 REMAINS OF THE MINING INDUSTRY: STRUCTURE OF RURAL NEIGHBOURHOODS

In the previous section, it was observed the influence of the mining industry on the built environment. This section provides a more up-to-date view of the influence of the mining history on the settlements. Overall, there are 145 declared Conservation Areas in Cornwall that collectively cover 4070 hectares of land. The village of Pendeen hosts six of these Conservation Areas (Map 6). Because of its status as a conservation area, any structural change, e.g., demolition of buildings, that could damage the character or appearance of the site requires extensive planning permissions, commonly known as a 'conservation area consent'. This is meant to preserve the views, open spaces, gardens, trees and boundary treatments, which make an important contribution to the character of the neighbourhoods.
Map 6. Conservation Areas
Most of the settlements in the Mining District consist of hamlets and cottage rows that are strung out along, or just off, the main road between St Just and St Ives (B3306), which edges the steeper slopes up to the moors. The network of neighbourhoods that was included in the study site of Pendeen was limited in the North by Morvah Schoolhouse Gallery, which sets the boundary to the civil parish of Morvah, and in the South by Truthwall and the BB3306 rd.

The following subsections will describe the spatial structure of the conservation areas that are part of the study site, based on information from the Penwith District Council (2012a-2012d) and observations performed during the fieldwork within the settlements. These descriptions will be supported by maps and images that illustrate each conservation area and its current built environment, to convey the extent to which the structural immobility of protected historic areas of the hamlets and their scattered distribution have played a role suppressing their development. The next subsections also examine the boundaries of the hamlets, based on the current built environment, and discuss the role of public and semi-public places in linking the, otherwise, very scattered micro communities.

6.3.1 Botallack
Botallack hamlet (Map 7) is located on the narrow coastal plain west of the Penwith Moors on the extreme west coast of Cornwall, less than a mile north of St Just and less than a mile from the sea. The industrial and pre-industrial landscape is perhaps more visible here than anywhere else in the area.
There is a contrast between the areas that are located to the east and to the west of the main road. To the east, Truthwall’s fossilised medieval field pattern is still in good condition, while the common land to the west has become overgrown and the mining landscape has been buried beneath a tangle of brambles. Botallack is linked directly to the wider landscape by a pattern of old hedges and enclosure boundaries. This is visible at the old manorial boundary, which continues further east as an access lane to the moors and is an important landscape feature.

Map 7 Botallack & Truthwall

The prehistoric settlement at Botallack was located at the gates to the present Manor House; there are also prehistoric remains on the nearby moors to the east. Botallack was also medieval manor in the 17th century. This was an ancient farming landscape of scattered farmsteads and
hamlets, each with their own small field system amongst the extensive open wastes and commons. Since the 16th century, these hamlets have been partly agricultural, partly fishing and partly industrial. Botallack is one of the oldest established mining areas in Cornwall. Deep mining became well established in the area by the 1770’s, and the earliest steam engines (at Carnyorth) were installed in 1802. The first mine at Botallack was built for the Crowns shaft by 1816. Parknoweth Mine was working in the late 18th century, and the southern mines at Wheal Owles and Wheal. In the 1830’s, the Botallack complex (Image 6) expanded and was turned into one of the greatest Cornish mines.

*Image 6  Botallack Mines*

As a whole, Botallack illustrates how the workings of the mines not only created settlements but also constrained their physical development and determined where land was available for building. This area was literally built upon old mine waste dumps, and in between active mines.

Now that the mines are out of service, the settlement is comprised mostly of farmland intermixed with the remains of the old mines aside from the South West Coast Path (SWCP), while the majority of households are
clustered within two main roads. Walking opposite to the SWCP into the inland, the single-lane road is bordered by well scattered rural cottages, farmhouses and barns gated by medium-height stonewalls, high enough to keep the livestock secluded while allowing hikers and pass-byers to take shortcuts avoiding the few cars that interrupt the peace of the almost desertic rural roads. Just 0.6 miles into the core urbanised centre of Botallack, the cottages become continuous and the limited number of public and semi-public places available within the neighbourhood become clustered in parallel to the main road. The Queens Arms, the only pub within Botallack, is a stone-wall tavern opened 7 days-a-week that congregates locals and visitors inside its walls and into its beer garden. The Queens Arms walls exhibit in pictures the history of the mining industry offering a cosy and warm lively space for locals to socialise about their latest everyday activities while keeping the past as a present recall. At the same time, due to its proximity to the SWCP, and the remains of the Botallack mines, the pub is the first friendly stop-by point for hikers going north from Cape Cornwall to rest and hydrate before departing to their next track. This would occur mostly during the summer months when the hordes of tourists with trekking poles will embark on the “migration” from urban to rural fields. The seasonal migration would also increase the occupancy of the holiday cottages in the area and the demand of recreational services within the whole SWCP route, with the expected increase of services such as public transport and extended opening times on restaurants, cafés, galleries, and other recreational spaces. Technology-wise, the tavern in Botallack would offer its visitors a reliable Internet connection free of charge, which would be mostly used by tourists who couldn’t find mobile connectivity on their way or whose rented cottage wouldn’t include such a service. Despite
the popularity of the Queens Arms within the neighbourhood, its location perpendicular to the B3306 rd would mean that neighbours from vicinity hamlets would find the place difficult to reach other than driving or cruising around the farmlands.

A few steps forward from the Queen’s Arms, on the opposite street, Wintara and a handful of other highly priced holiday cottages would increase Botallack population within the holiday period, with the downside of leaving parts of its main street almost desertic once the summer is over.

6.3.2 Carnyorth
Carnyorth, the next hamlet observed, is located between Botallack and Trewellard, about half a mile from the sea (Map 8), and approximately one mile south of Pendeen. It is composed by Carnyorth Hill, Carnyorth Terrace and Falmouth Place and borders Trewellard to the south as part of a string of settlements along the main north-south road that follows the meeting point of the steep slopes up to the high moors with the level coastal plain. Much of this lower landscape consisted of blocks of open common grazing, heath and moor (Carnyorth Moor).

The area to the west of the Carnyorth used to be open ground until it was enclosed in the early 20th century. Carnyorth Moor was covered in an extensive and complex pattern of mining remains until the wholesale clearance and scraping of old dumps by Geevor Mine in the 1980s and subsequent agricultural improvements left an open, featureless agricultural landscape.
Since its very foundation, the hamlet has been partly agricultural and partly industrial (tin streaming, mining and processing). The ‘industrial’ population remained very small though, and the historic settlements were able to absorb whatever pressures the expanding industry put on them for many years. Old agricultural or industrial buildings that have survived in Carnyorth Hill have been converted for residential and holiday use, particularly on the west side of the road. This has involved the complete remodelling of buildings rather than a sympathetic conversion. At the same time, a large number of pairs and short rows of three cottages have by now been combined into single houses to absorb the population decline and the demand for increased quality of housing without the need for new buildings. Even today, there are just a handful
of new houses; a few bungalows and imitations of vernacular stone-clad houses.

With the acceleration in the scale of tin stream working and mining in the late 18th and early 19th centuries, cottages and outbuildings were added to the old hamlet around its central ‘town-place’. Entirely new hamlets were also created to the south (Carnyorth Terrace and Falmouth Place on the edges of the old common moors and mining grounds. All this growth was related mainly to the strength of Carnyorth Mine, the earliest in the St Just area to have a steam engine (1802). This mine reached its peak in the mid-19th century, as did the expansion of the hamlet, but it finally closed in 1875 at the time of the tin price crash. Although the population and employment undoubtedly declined, Carnyorth remained sufficiently healthy to acquire a Methodist Chapel (1886) and a school (1892) for the mining families, but it barely developed any new houses until the mid-20th century.

In more present times, the hamlet is mostly constituted by residential properties. In the remains of the village school, the Carnyorth Outdoor Education Centre, an activity centre was established. The Carnyorth Outdoor Education Centre organises canoeing, kayaking, cycling and climbing on a residential and non-residential basis and it is almost exclusively used by young or corporate visitors participating in organised outdoor activities (e.g., School trips) and not by the local population. Internet can be controlled at the discretion of the visiting group leader and Head of Centre but is inaccessible for the hamlet’s residents. Carnyorth is one of the smallest hamlets in the area with less than a hundred buildings disseminated within a few curvilinear loops and cul de sac streets. Nonetheless, that has not been a limitation factor in
attracting tourists and at least 5 cottages have been converted into luxurious holiday lettings dedicated solely to receiving summer visitors.

6.3.3 Trewellard
The narrow level tract of land between the higher granite moorland of West Penwith and the steep coastal cliffs consists of ancient farmland interspersed with blocks of formerly unenclosed common grazing, heath and moor. Ancient settlements can be found in sheltered spots between these lower commons and the steep coastal slopes (Pendeen Manor, Lower Boscaswell, Trewellard Manor, Botallack Manor). These settlements are set in a landscape of scattered farmsteads, hamlets and small field systems, situated amongst the extensive open wastes and commons, and linked by lanes and tracks running parallel to the later main road.

Farming and tin mining have been of equal importance in and around Trewellard (Map 9) from the 16th century onward, together with fishing from the small local coves. The surrounding area was one of the oldest continuously worked mining areas in Cornwall – the cliffs were worked since the old times, while Trewellard Hill was renowned as one of the great mining areas of the 16th, 17th and 18th century Cornwall. The local economic rise began in the 1820s with rich returns from Levant Mine (employing 500 people by 1830).
With the mining boom that occurred in the 18th and early 19th centuries new settlements needed to be created. The old centre at Lower Trewellard saw a great amount of infilling with an increased house density to meet the new population demands. At the same time, new developments outside the old manorial hamlet also took place on the slopes of Trewellard Hill.

Apart from occasional infill of isolated bungalows in Lower Trewellard, and the old scattered cottage area of Hillside and Jubilee Place, late 20th century developments concentrated along Trewellard Hill. Considerable housing development took place within the hamlet ‘envelope’, and largely on old mine waste and on the site of the old East Levant Mine. The main extensions to the hamlet were to the south, on the road to Carnyorth, with the building of the industrial estate and the Parc-an-Yorth.
housing estate. To the north, the old Wethered Shaft complex was developed as a museum, while the main mine at Geevor was still in operation.

In the present, Trewellard concentrates its public and semi-public places in parallel to the B3306 rd. It encompasses an old-fashioned gas station and an auto repair shop/convenience store that are open Mon-Sat, neither of which are connected to the Internet or provide Internet hotspots to their customers. However, after having problems with their landline they now provide updates online about the availability of services and resources on their online page.

At the bottom of Levant rd, the remains of the famous Levant Mine are located with a small souvenir shop inside the main venue. The museum is a historic landmark, and it is visited primarily by tourists while its surrounding areas are frequented by locals on their daily walks. The museum opens only during the summer touristic season and has an Internet connection, but it does not offer any type of hotspots to its national and international visitors.

Back on the road B3306, at the entrance of the hamlet, Trewellard Arms is a local Pub and B&B that receives tourists passing by the area, hikers returning from Levant mine and local neighbours interested in watching the last sport matches. Because of its proximity to Levant Mine and its accessibility to pedestrians, it is one the main meeting point for the inhabitants of Trewellard, functioning as a space where locals and visitors can blend and use their Internet connection if they pleased.

Almost in front of the Pub, the Field House Café and B&B is hidden behind the walls of an old-style cottage. It is mainly focused on attracting...
tourist, providing them with accommodation, breakfast and also Internet access. One block further, there is Trewellard Meadery a very popular ‘local’ restaurant. The Meadery opened more than 50 years ago and offers dinners on weekends only. Local families compete with tourists to find a table and reservations must be made well in advance. Unlike in the Trewellard Arms, different groups of visitors rarely interact with each other, and it is mostly a place for families or groups of acquaintances to enjoy a meal together. Internet access can be provided to customers, but it is only rarely requested. Notably, Trewellard also encompasses many holiday cottages in between Levant Road, the B3306 and Trewellard Hill.

6.3.4 Pendeen

Rather than being a traditional ‘nucleated’ hamlet, Pendeen presents a closely packed group of housing areas, distributed among Crescent Place, Church Road, North Row, Higher Boscaswell and Portherras Cross (Map 10).

Given the long history of mining in the area, there are different industrial elements encompassing the landscape. The moors and commons once extended all around Pendeen and have still survived in part (Boscaswell Higher Downs and Trewellard Common to the south, Boscaswell Lower Downs and Carlartha Common to the north, Bojewyan, Stennack to the east). The more anciently enclosed farmland is in a narrow strip closer to the sea, where Lower Boscaswell and Pendeen manor stand. The principal manor house in the area was rebuilt in 1670 by John Borlase on the proceeds of tin mining. This whole area is now enclosed by stone walls or old Cornish hedges and put to grass or cropped, with only a few scattered and low trees, giving the impression of a fertile agricultural plain.
The industrial landscape is centred around the Geevor Mine, which is only a few fields away and can be seen from many places in the area. There are other freestanding chimneys and old engine houses in and around the settlement. The largest and most important surviving relict of the mining landscape is located in the very heart of Pendeen at Higher Boscaswell.

Pendeen has conservation areas, but also new housing areas. There are long, packed rows of cottages among the vestige moor lands and open field’s cape, which come right to the pavements and the backs of the small cottages; the building complex in Church Road stands close to the irregular open grazing of Trewellard Common. Pendeen interlinks the
mining ruins and the side roads; some of the built form is ‘urban’ in character, yet the different housing areas are scarcely connected.

The shape and structure of Pendeen resemble a ladder, with the long southwest to the northeast spine of the main road being crossed at right angles by roads, paths and tracks. The main road is intersected by a series of inward clusters of buildings that are separated by indistinct open spaces. The built-up streetscape outlined on each side of the road makes it difficult to define what is further out in the back streets. The open spaces between and behind the street frontages contain most of the community spaces – children’s playgrounds, sports fields, graveyard, informal recreation and sitting places, and they link together what can seem like unconnected groups of buildings. The close relationship between St John’s Terrace and the church complex is only revealed from within the ‘back’ lands that are linked through a network of tightly enclosed back lanes, walking paths and rough tracks. These tracks are one of Pendeen’s most characteristic features giving Pendeen a sense of being set in its own unique landscape.

Throughout all of these areas, and along many of the paths and tracks, private and public green areas intermix. This situation can make access to public spaces and places, in general, more difficult for outsiders who are not well aware of the property boundaries and the precise location of footpaths. Some of these characteristics are subtly different between the western and eastern halves of the hamlet: the south side of the road by Boscaswell Terrace and Calartha Terrace has few points of direct access to the countryside by tracks and lanes, and little even of the sense of open green space coming right up to the roadside, although the historic buildings and townscape are just as interesting as elsewhere in Pendeen.
The network of paths and lanes allows movement and views essentially everywhere. As back elevations scarcely exist, almost everything in the area is open to public view, if not from close-by in the lanes, then from Carn Eanes.

Since the closure of the mine, both Lower Boscaswell and Pendeen have become more dependent on a wider range of economic activities, and have become mostly residential centres, with new house building and conversion of old agricultural buildings. Some important service buildings were built in the area, including a new school in 1916, Men’s and Women’s Institutes (1930), and a doctor’s surgery.

6.3.5 Boscaswell

Boscaswell (Map 11), better known as Boscaswell Lower Downs, is located between the granite moorland of West Penwith and the cliffs of the coast as a relatively level tract of land. It consists of blocks of open common grazing, heath and moor separated by sheltered valleys leading down to the sea. Lower Boscaswell occupies an inclined site above the coastal slopes, just below the more exposed coastal plain. The narrow lanes, tracks and footpaths that cut between and amongst the cottages run directly out into the landscape, leading in many cases to old mining sites - a direct physical and visual relationship with an industrial landscape of international importance. Apart from the great complex at Geevor, the hamlet is contained at its eastern end by the 1960’s complex at Treweek’s shaft. There are also remains of shafts, dumps and sites over the former Boscaswell Lower Downs to the north and east. Lower Boscaswell retains evidence of its antiquity – an Iron Age courtyard house, a fogou, an early medieval Holy Well (the Hesken Well) and Lower Boscaswell Farm (medieval in origin although the surviving buildings are later). All of these
buildings are located in the north-east / south-west track following the coast.

Map 11 Boscaswell

Boscaswell was established as an ancient farming settlement in a landscape of scattered farmsteads and hamlets, each with their own small field system amongst the extensive open wastes and commons. By the 16th century, these hamlets were partly agricultural, partly fishing and partly industrial, with tin stream-working within Boscaswell Downs, Calartha and Portherras, and some coastal extraction. For a long time, the numbers of inhabitants involved in tin working were relatively small, and the local settlements were able to absorb whatever pressures the expanding industry put on them. The boom of the mining industry in the early 19th century changed this and created a need to house the new industrial population. From the 1820's onward, local mines (at both Lower
and Higher Boscaswell) were developed – the main period of working lasted until the late 1850’s.

Pendeen and Lower Boscaswell together are the hamlets containing the highest number of places of common interest for locals and visitors. They comprehend three different recreation areas other than the widespread green places part of the countryside scenery: a small playground, a contained green space aside from a small pond in Levant Road, and the football court of the local team Pendeen Rovers AFC. The playground is visited regularly after school hours by small families and children, while the football court gets together the younger generations of (mostly) men during the football season. The case of ‘the Leat’ is somehow ‘peculiar’, as in better years this piece of land was given to the community from private ownership to serve as a space ‘created and cared for by the community for the community’ (James, 2018). But practically in disuse, and continuously neglected in more recent years by the highly ageing population of Pendeen, The Leat has become an almost yearly challenge that gets together local members of the village, as well as National Trust volunteers, and members of the Town Council to trim the outgrown grass and clean the small pond, avoiding the area to look again as the wasteland it once was. These leisure areas, as most of the green space in Cornwall don’t offer Internet connectivity.

At the west of Boscaswell, Geevor Tin Mine is probably the greatest attraction and source of jobs in the area. With different building remains of the golden years of the mining industry in Cornwall, Geevor Tin Mine gives visitors an opportunity to visit a real mine and to learn what life was like for a Cornish miner. It also has a shop and a café (the Count House Café) with one of the best views in the area a plus is its superfast Internet
connection. The Count House Café is one of the biggest and busiest places in the area, which receives tourists and locals alike. It also provides access to power sockets, allowing people to bring laptops to the café if they need to work.

In the corner of Church Road and the B3306 rd, Heather’s Coffee Shop was one of the main meetings points for the residents in the area. It was normal to see people congregating there for Sunday brunch after the weekend service at St John the Baptist, the local church located at the end of Church Road. Tourists could also be seen taking pictures of the broad selection of cakes offered in the small but cosy venue, which provided a superfast Internet connection to all local and strangers. However, unlike the Count House Café where people would sit and work or have more professional meetings, this place would mainly serve to socialise and only on very few occasions people would be seen using mobile phones not to mention laptops.

Just a few steps north of the coffee shop and on the opposite side of the street the Centre of Pendeen would be found. As detailed in Chapter 4, the Centre is currently serving as a community venue for a wide and diverse range of activities and events, including the meetings of the Pendeen’s Women institute, the Cinema, the Snooker and Pool Club, the gardening group, the Farmers Market (held the first and third Saturday of the month) with a highly attended community coffee. Notably, the Centre is the main point providing access to superfast Internet, computers, printers and photocopiers, and even to Internet training for locals and to some visitors who lack connection in their holiday stay.

Despite the diversity of activities hosted by the Centre and the great efforts of the volunteers to make the community venue as inclusive as
possible, the pool of attendants appears to come from a rather homogenous social network. Most of the regular people visiting the Centre are retired members of middle-class families that are highly socially engaged and who live in the vicinities of the Centre of Pendeen. The Centre of Pendeen has a strong community of regular attendants. However, after regular visits, it was observed a very low inflow of non-regular visitors which was confirmed during the collection of the local survey, where numerous inhabitants mentioned not being aware at all of any activities taking place at the Centre. In the same vein, results from the study survey revealed that only few locals were aware of the Internet support provided by the Centre. Notably, this was the case even for residents who were living in very close proximity to the Centre of Pendeen, who expressed feeling left behind by the use of new technologies, but were completely unaware as to where to ask for support (see Chapter 7 for details).

On the same street of the community centre on The Square, was the busy North Inn, a traditional Cornish pub and B&B that is attended by both locals and tourists and that offers a superfast Internet connection to all of its customers. The North Inn is a vibrant place that offers a variety of food and drinks in a friendly and casual atmosphere. Interestingly, there is a close link between the North Inn and the Centre of Pendeen: many of the locals who are engaged at the Centre are also regular customers of the pub to continue their conversations after completed activities. Conversely, the pub owner, who is also the husband of the Centre’s chair, often refers people to the centre when they express interest in or concerns about issues that the Centre is engaged with.
On the corner of The Square, the Post Office would offer to its customers services through its Internet connection such as a drop & go of mail and parcels; money exchange of foreign currencies; tickets of national express, and account services. It would also offer a community board for the inhabitants to post messages about the different activities available in the area and even to request services such as lifts for medical appointments. As mentioned in Chapter 4, it must be remembered that Pendeen and Cornwall in general lack a reliable transport network, which can disconnect even further parts of the populations already inhabiting isolated areas.

On the next block, the last of the places in these hamlets was Radjel Inn, a nostalgic Pub that was mainly visited by locals living in the estates behind the pub. Tourists did not attend this pub regularly, so the owners would just provide the Internet password of the hotspot upon request, which was different than in the remaining venues of the style in the area. The pub’s regular customers form a cohesive group and new visitors are immediately recognised as such. They mainly came to the pub for drinks and social interaction. The atmosphere is lively, and people often come to discuss social and political issues. Interestingly, unlike in the North Inn, customers of the Radjel Inn expressed only little interest in the activities of the Centre of Pendeen and did not know much about their services, despite the spatial proximity.

The same area of Pendeen contained additional third places, namely the Pendeen Pottery and Gallery that provided the tourists with a glimpse of the Cornish crafts, the Pendeen’s Surgery that provided medical attention to the residents, and Lil’s Chip, the local fish & chips takeaway, and just aside it Costcutter, the local convenience store. None of these places
provided Internet connections or information about Internet-related services.

Calartha and Boscaswell Downs are mainly residential areas and even the Lighthouse has been turned into a holiday letting. Adjacent to it would be Bojewyan, where Bojewyan Pottery would open its doors upon request to tourist to acquire Cornish Ceramic. Some holiday cottages could also be found spread next to the aforementioned hamlets.

6.3.6 Bojewyan

Bojewyan (Map 12) is located within Portherras Valley. It is situated between Pendeen and Morvah, and about half a mile from the sea in Penwith District. Bojewyan consists of two distinct but linked hamlets: Higher Bojewyan, a medieval farming hamlet, and Bojewyan Stennack, an industrial settlement. The road that crosses both parts of Bojewyan is the only formal pedestrian link. Farming is still a major element in the area, and the smaller farms working in Higher Bojewyan in the mid-20th century were absorbed into a single unit. Barns, storage and processing buildings and yards have been converted and nowadays form the heart of the settlement, standing aside to more recently built cottages and houses.
The hamlet has a considerable number of protected historic buildings, due to its setting around a sheltered valley (the Stennack), close to the moors and the wild coast. Its ancient farming hamlets stand cheek-by-jowl with 19th century industrial settlements all along the narrow coastal plain between the high granite moorland of West Penwith and the steep coastal cliffs with their fishing coves.

Farming, fishing and tin working with some coastal cliff extraction have been of equal importance in and around Bojewyan from the 16th century onward. The density of surviving remains shows that this area was intensively settled since prehistory. During the industrial era the population maintained steady, allowing the historic settlements to absorb the needs of an expanding industry. It was not until the early 19th century when Bojewyan started to grow suddenly. The expansion of
agriculture intensified locally at the same time, partly as smallholdings were created for the part-time miners to supplement income and diet, but also as the larger farms increased in size and levels of production. Bojewyan was never a purely industrial settlement area and agriculture continues to dominate the landscape today. Following the decline of mining and milling in the late 19th century, population pressure on the settlements went into reverse. Already by the 1880's, outlying smallholdings had been abandoned, and cottages that dated only a single generation had been demolished in the hamlet, especially in Higher Bojewyan. Until the late 20th century, both Higher Bojewyan and Bojewyan Stennack declined in population with some marginal loss of cottages at both settlements. During this time, higher Bojewyan reverted to become predominantly a farming settlement. Apart from a small farm at Ponds Hill, Bojewyan Stennack decreased in population and the complete clearance of all the cottage rows was proposed, though a grant aid in the 1980's enabled their refurbishment. Both settlements have now become residential hamlets with a sizeable number of holiday lets.

The designation of these areas has been argued to be of vital importance in protecting the historic heritage of the hamlets. However, it can also be argued that there are thousands of other buildings that despite being interesting and attractive - and perhaps important on a local scale - are not ‘listable’ in themselves. In other words, they have not been perceived as having sufficient national architectural or historic interest to merit individual protection. That is the case of the last neighbourhood included in this study.
6.3.7 Morvah

Morvah lies within the Cornwall Area of Outstanding Natural Beauty (AONB) near the north coast of the Land's End Peninsula. The village is centred approximately eight miles southwest of St Ives, along the B3306 rd, and 5 and a half miles northwest of Penzance. Its name “Morvah” is believed to derive from the Cornish Morveth meaning 'a place by the sea'.

Morvah encompasses Chypraze and Rosemergy settlements. It is bordered by St. Just parish to the west, Zennor to the north-east, Madron to the south and by the sea in the north. It is not a settlement of easy accessibility other than by car or bus as while it is just 0.8 miles away from Bojewyan, there are no shortcuts or walking trails for pedestrians other than walking aside the very narrow and busy B3306 rd.

Morvah consists of disseminated stone cottages and a few places for social interaction such as Yew Tree Gallery and Harry's Cafe, which attracted tourists and locals interested in the contemporary art exhibitions. Eight hundred meters later would be Morvah Schoolhouse Gallery and Café, a space for local artist to exhibit their work and for the few locals remaining in the settlement to join for a cup of coffee. Both venues were connected to the Internet but at least one (Morvah Schoolhouse) stopped providing Internet access to its visitors, as ‘some local people would only go there to use the Internet without consuming’ (Female, 20 September, 2016), such behaviour was not well received by the managers. Morvah also hosted Chypraze Farm, a rare breed farm, butchery shop and wedding venue on the rugged West Penwith Cliffs and several holiday cottages and the parish church.
The Parish Church of Morvah was dedicated to St Bridget of Sweden which would attract many Swedish visitors to the area. The tower dates from the 14\textsuperscript{th} century while the chancel and nave were rebuilt in 1828.

\section*{6.4. SOCIAL GROUPS AND PATTERNS OF LIFE}

This final analysis section examines the socio-cultural dynamics taking place within the community of Pendeen. Based on extensive observation during fieldwork, it delineates the existence of four largely segregated groups, and describes the patterns of life these groups follow and the role of digital technologies therein.

\subsection*{6.4.1 Traditional locals}

The first social group was identified as traditional locals. This group of inhabitants consisted of a network of families that have lived in Pendeen already for many generations (sometimes even in the same house). Members of these families often inherited occupations from their relatives, which would typically involve manual labour such as farmers, mechanics, plumbers, or people working in local pubs and restaurants. In general, traditional locals had very close social circles with most of their friends and family living nearby. They formed a highly cohesive social group and performed many traditional activities together. For example, on Sundays, the traditional locals would attend the Sunday worship where they would meet with their relatives and friends and then they would visit the local café for lunch. The younger generations would get together for some football matches at the local football club, while some more mature adults would meet at the Radjel Inn to watch sport matches or would get together at the Upper lever of the Centre of Penden at the Snooker and Pool Club.
Perhaps due to the high level of social cohesion among traditional locals, there was little interaction with the remaining inhabitants within the village. Traditional locals had a strong sense of belonging to the village and enjoy spending time with people with whom they share their life context. Moreover, many traditional locals were living on low incomes, due to their occupation. This meant that they could not afford to participate or attend some of the social activities taking place in the village on a regular basis. Nonetheless, most traditional locals would not consider themselves disadvantaged, as they tended to judge their own situation primarily with respect to members of their own social group. Some of them were hesitant to talk about their living situation, as in the past, research projects conducted in the village had labelled them a “deprived community”.

Traditional locals generally expressed very little interest in using new technologies and were almost entirely disconnected from the Internet. Most of them owned a mobile phone but would use it only to make phone calls or to send and receive text messages (see results from Chapter 5). Some of them did not even have a television at home. Importantly, most traditional locals expressed no experience of missing out on anything by not using ICTs including the Internet. It simply appeared irrelevant to their lives, as it was not required in their occupations or to maintain social relationships. Consequently, they relied strongly on word of mouth and trusted face-to-face interactions for their daily activities (e.g., when accessing services).

There were a few notable exceptions among the traditional locals who would use the Internet at least occasionally, and those inhabitants did indeed maintain social connections with inhabitants outside their primary
social network (see Chapter 7 for details). On the whole, however, those cases were clearly the exception to the rule and did not add up to change the perceived utility of new technologies within this social group.

6.4.2. Isolated newcomers

The second group of inhabitants was defined, in part, as not actually being part of any community within the village. The isolated newcomers consisted of elderly people who had moved to Pendeen for different life circumstances, such as their retirement, after losing employment, or having been relocated there. Many of them used to live in urban centres of the UK and decided to move to Pendeen primarily for the low costs of living. They would live rather isolated lives there, spending the vast majority of their time at home, either alone or together with their spouse.

Isolated newcomers expressed a high demand for digital technology. They needed the Internet in order to stay in touch with their friends and family living elsewhere and to keep up to date with the news as well as for entertainment. Interestingly, they accessed the Internet primarily at home, as most of them would leave their houses only for necessities such as for going to the supermarket.

In general, isolated newcomers reported feeling rather estranged from the remaining inhabitants whom they would perceive as quite provincial and narrow-minded. As a consequence, they would not engage in activities within their local neighbourhoods but rather seek entertainment in the larger towns of Penzance or St Ives, even when they same activities (e.g., playing snooker) would be available nearby.

Importantly, isolated newcomers appeared to use a completely different reference to evaluate their situation than the traditional locals. They
would judge their life situation either in comparison to their previous lives in the city or to those of their friends who still live there. Therefore, many of them would complain about the lack of available activities and services as well as the quality of Internet connections, especially when traveling.

6.4.3. Connected newcomers

The third group of inhabitants that was identified consisted of a large number of socially active retirees who had moved to Pendeen from urban centres and formed their own new community there.

Most connected newcomers came from middle-class backgrounds (e.g., retired teachers, lecturers, artists, dentists) who decided to come to Pendeen because they wanted to be close to nature and avoid the stress of the city during their retirement. They engaged in numerous social activities, e.g., yoga, tai chi, book and movie clubs, spinning classes, snooker, allotment societies, recycling hubs, or farmer’s markets. Most of those activities were organised centrally by the local community centre with the intention of maximal inclusivity. Connected newcomers expressed a high degree of community spirit and wanted to be inclusive to everyone within the village. However, ultimately, this social group also became somewhat closed, as they were perceived as outsiders who would try to import their urban lifestyle into the village of Pendeen. As a consequence, there was very little interaction between the connected newcomers and the traditional locals who appeared to occupy different spheres within the same village. The connected newcomers had tried to remedy this situation by promoting community-based services, including access to Internet, free of charge to people on benefits or low income. However, these promotions would either go unnoticed, due to the
segregation between social groups within the village, or they would be perceived as ‘handouts’ or ‘charity’ that people from the group traditional locals were not willing to accept.

In general, connected newcomers would use technology a lot. Most of them had very solid digital skills and owned suitable devices to connect to the Internet from multiple locations. Most of them lived in central locations with decent Internet connections but many also complained about how spotty the Internet can be when moving around Cornwall. Connected newcomers used the Internet for a variety of purposes from staying in touch with friends and family, to following the news, commercial activities (e.g., placing advertisements for self-made pottery) and even civic engagement (e.g., crowdsourcing of resources for the community centre). For them, the Internet appeared critical to maintain the standard of living that they had become used to and to make the most of their retirement in Pendeen.

6.4.4. Young commuters

The fourth and final group of inhabitants that was identified consisted of young people (mostly men) in their 30s who had used to live in more urban areas in the proximity (e.g., St Ives or Penzance) but subsequently moved to Pendeen, due to the affordable housing there. For example, a man in his 30s who was working at the train station in Penzance mentioned that the high costs of living would not allow him to live in Penzance, so he decided to live in Pendeen instead, where houses prices are significantly lower. Young commuters were all employed or in education programs. Since their families, friends and colleagues were all located elsewhere, they would spend the vast majority of their time
outside of Pendeen, leaving it early in the morning and returning late in the evening. They showed very little engagement with the local community with the exception of a few young commuters who had joined the local football club. However, even in these cases, young commuters would limit their interaction with the remaining population to the shared interest and otherwise live separate lives.

Notably, young commuters expressed a high degree and ubiquity of technology use. Most of them owned a laptop, a mobile phone, a work computer, and additional devices and would be constantly connected to the Internet. They used the Internet for vast variety of purposes, e.g., shopping, navigating, education, work, services, following the news, and maintaining social relationships.

Young commuters were distributed across the study site, but tended to live in locations outside the centre, close to the Internet cabinets, where they would receive comparatively good levels of connectivity. While the connectivity at home was usually rated as satisfactory, they would also complain about the spottiness of the network coverage when moving around Cornwall.

6.4.5. Conclusions

In summary, the analysis presented in this section revealed the existence of strong social segregation between different social groups living in Pendeen. Even though no clear spatial segregation between the members of those groups was evident within the study site, they would very rarely interact with each other and approach different public and semi-public places in their leisure time.
Accessing the Internet appeared to be a problem primarily for traditional locals who would not perceive digital technologies as useful for their lives, whereas the other three groups were all frequent users of the Internet and considered it important for their lifestyle. These differential perceptions of digital technologies between the members of the different social groups are likely related to differences in their socialisation. Socialisation refers to a process of life-long learning that shapes internalised beliefs about one’s own position within society and the kinds of norms, values, and behaviours that are considered appropriate within that position (Hurrelmann & Bauer, 2018; Maccoby, 2008). In the context of the digital divide, groups with different societal status may come to internalise different beliefs about their role in a digitised society (e.g., based on the digital competence of their parents and peers, their level of digital engagement in school, or the portrayal of technology use as a lifestyle in the media). Hence, for traditional locals, new technologies appear primarily as disruptive of familiar and valued life patterns, and they are seen as part of a “posh” lifestyle of the urban upper-class, so they are reluctant to leave their comfort zone unless they have reason to believe that their use will lead to concrete and immediate benefits for themselves or their family (see Chapter 7 for details).

A socialisation perspective may also explain why the perception of disadvantage within the study site would be highly subjective. As such, isolated newcomers would feel more disadvantaged than traditional locals, even though they would be considered better off by most conventional metrics. Evidently, the perception of disadvantage critically depends upon the reference used for social comparison (Goethals & Darley, 1977), and most people tend to compare themselves primarily to their peers and/or their former self but only rarely to people that are
perceived as dissimilar (e.g., because they belong to different social groups). These biased comparison mechanisms may be adaptive for individuals in the short term by protecting their well-being, but they may also contribute to the persistence of inequalities, as disadvantage will only be questioned and ultimately changed when it is perceived as problematic in the first place (Helsper, 2021; Janmaat, 2013).

Regarding the role of third places as potential technology enablers, the analyses revealed mixed evidence. On the one hand, the identified third places in the study site were indeed accessed for Internet use and could in some cases provide a safe space for learning and knowledge exchange that allowed several inhabitants to enhance their level of connectivity and achieve desired outcomes (see also Chapter 7). On the other hand, however, due to social divisions in the village, those inhabitants who would potentially benefit the most from these opportunities were the least likely to take advantage of them. Overall, the observed combination of social segregation and group-dependent valuation of technology pose very difficult challenges for any interventions seeking to promote digital engagement.

6.5 SYNTHESIS AND DISCUSSION

This chapter presented a historic analysis of the Tin Coast area alongside a description of its current spatial structure. This analysis revealed remarkable stability of the area’s development since its historic origins with the spur of the mining era. Although some houses and estates have been built since then, the vast majority of the neighbourhoods are compartmentalised by and clustered around the core of the original
mining settlements, while the overall inhabited area and the number of inhabitants have shrunk. With the decline of the mining industry in the early 20th century, the area’s economic prospects have dramatically declined, leading to a transformation from a flourishing industrial area into a highly disconnected seasonal holiday destination that showcases the remaining foundations of its mining past. This status of Pendeen as a historic conservation area has placed strong constraints on any form of urbanisation, including the installation and enhancement of Internet infrastructure. The problem is further aggravated by the area’s low population density and demographic composition (as mentioned in Chapter 5). Due to the lack of economic prospects, Pendeen has experienced significant outmigration of young people, leaving behind scattered hamlets inhabited by seasonal tourists (attracted by the idea of the “digital detox” offered by the rural countryside), and a continuously ageing local population, some with limited to no interest in new technological developments. Map 13 displays a handmade map of Pendeen portraying the highly commercial life in the village from the 1920’s to the 1930’s, while Map 14 showcases a more contemporary scene, illustrating the decline of the village from a prosperous area with numerous amenities for the mine workers to scattered hamlets with just a handful of services for the locals.
Map 13 Pendeen in 1920’s & 1930’s


Map 14 Pendeen in 2015-2017
As a consequence, the few locals seeking high-quality Internet connectivity do not easily add up to constitute a critical mass, for which the enhancement of infrastructure could become profitable.

Within these dispersed settlements, public and semi-public places play a central role in linking the different neighbourhoods and intermixing their populations. As such, places like pubs, the local church, the post office, the community centre, the medical practice, local shops and the gas station form a network of services that connect the different hamlets intermixing populations that otherwise would not have the possibility to interact in the same space. This chapter explored to what extent such ‘third places,’ as the ones described by Oldenburg (1991, 2002), could facilitate people’s access to the Internet.

This analysis yielded a number of important observations complementing the survey data reported in the previous chapter. Firstly, it became evident that in fact, many inhabitants were trying to use the Internet in third places such as cafes, pubs, galleries, or the local community centre. Some of these activities occurred even in circumstances when they were undesired, as in the Morvah Schoolhouse and café, where people’s need to obtain Internet access outside of their homes and/or workplace was not well received by the managers of the venue who opted to cancel the free provision of the service. Interviews with the inhabitants revealed diverse motives and requirements. Some inhabitants approached third places because they did not own suitable devices. For example, a schoolteacher reported visiting the Centre of Pendeen on a regular basis to prepare for her classes, as her computer at home was broken (see Chapter 5). Others would be waiting for an Internet connection to be installed at their home or were dissatisfied with the quality of their home
connection and would therefore attend third places for their enhanced access. For instance, Judy, a 66-year-old retired woman who recently moved to a house in Pendeen, expended several hours each week at cafes that offer free WiFi to access social networks and instant messaging to stay in touch with people on a more regular basis (see also Chapter 7 for details on her case). Some inhabitants would also approach third places for social support (theory), as they were lacking not only devices but also the skills to use the Internet effectively for their needs. As such, Joe, a 68-year-old volunteer at the community centre with no Internet connection at home, reported that he learnt to use the Internet in the ‘Hall’ (referring to the Centre of Pendeen), where he had found the (social) support to learn new things and to keep active as a mature adult, as he also did volunteer work there. He mentioned using the Internet just for the more basic services but to be happy with the new experiences and opportunities that this entailed. Collectively, these observations underscore the multifaceted role of third places in facilitating access to technologies by providing means to enhance levels of material, motivational, and skills access.

Among the third places within the study site, the Centre of Pendeen played a central role. Within the whole Parish of St Just, it is the only place that provides visitors not only with access to computers and related devices (e.g., printers and photocopiers) on a regular basis but also with resources to improve ICT-related skills. As mentioned in Chapter 4, this has been made possible through the admirable work of volunteers aiming to support their community and to provide help to those in need of it. This work has yielded some undeniable success stories of local inhabitants who learned to use the Internet at the Centre and gained the confidence to perform a new set of activities online, leading to concrete
positive outcomes. Most of these cases have been senior residents who wanted to learn to use the Internet to stay in touch with relatives or to access relevant services such as health care or universal credit.

At the same time, it was also evident that the Centre was only capable of reaching a fraction of the local inhabitants. One reason for this was its location, favouring inhabitants living nearby, or those who were mobile because they owned a car or were fit enough to take a long walk among the walking paths to reach the Community Centre. Another reason was a pre-existing social division among the different hamlets. The Centre was organised and visited primarily by a network of educated and socially active professionals and retired people (many of whom have relocated to Pendeen for their retirement and who share family links with the local inhabitants). In contrast, the Centre was far less successful at engaging those inhabitants with lower education and income levels who were living mostly in the offshores of the hamlets and with those members with little to no social links within the village. In fact, these different groups generally lived largely segregated lives and mix only in a few places, such as the Post Office, the GP, the Bus stop or the Gas Station, where little verbal interaction would take place.

As a consequence, many people living in some of the neighbourhoods would not know at all about the activities at the Centre of Pendeen and were thus getting excluded from the potential access to technology and social support in learning how to use the digital platform.

These results complement the findings discussed in Chapter 5, which showed a link between the number of social contacts and the extent of digital engagement. Evidently, the beneficial effects of social networks on technology access are not universal but dependent on the
characteristics of other network members. As stated by DiMaggio et al. (2012), social networks are typically *homophilous*, which means that individuals would show a tendency to associate and bond with similar others (e.g., with similar education, age, class). Therefore, non-ICT users will be much more likely to overcome obstacles with new technologies and/or learn where to access them if they have acquaintances who are already technology adopters in their social networks. These observations illustrate important challenges for interventions seeking to tackle digital inequality by increasing technological support in community venues. While community spaces, like the Centre of Pendeen, can serve as great starting points to approach technologically disadvantaged communities, their selective outreach can amplify pre-existing inequalities within the local population and exclude those inhabitants who would be in greatest need of support. From this perspective, the possibility to mitigate the digital divide requires finding ways to genuinely intermix local populations and enhance the social capital of its most disadvantaged members.
Chapter 7. Understanding digital inequality in Pendeen through the lens of life narratives
7.1 INTRODUCTION

As outlined Chapter 2, the objective of this research project was to understand mechanisms that underpin the digital divide in the rural UK and reveal the most important barriers to Internet use within the study site. The previous two chapters examined sources of digital inequality in Pendeen by establishing associations between individual person variables and Internet use (Chapter 5) and by delineating how the historic particularities of the study site have constrained infrastructure, patterns of life and valuation of new technologies (Chapter 6). The current chapter aims to complement these perspectives by zooming in on the specific life narratives of individual inhabitants with varying levels of access to the Internet and by illustrating their specific living conditions. This information was obtained through a combination of face-to-face interviews and observations and served to integrate the different perspectives on the digital divide that were outlined in the previous chapters and to illustrate how they play out in the lives of individual inhabitants, resulting in diverse levels of digital engagement.

The remaining chapter consists of two subsections. Initially, section 7.2 will provide the narratives of 10 selected inhabitants. Thereafter, section 7.3 will synthesise the results from those narratives and discuss their general implications.

7.2 INDIVIDUAL NARRATIVES

Please note, all names on this chapter have been changed to maintain the anonymity of the participants. All cases reported on this section are based on the individual interviews obtained during the collection of the surveys within the village.
7.2.1 Interchangeable capitals

Judy has already been briefly mentioned in the previous chapter. She is 66 years old, retired and has been going online for around five years. She considers herself a fair Internet user, and lives with her partner who also uses the Internet, though, according to her he doesn’t know how to use it very well. Judy mostly uses Internet to access social networks and instant messaging, which allow her to stay in touch with people on a more regular basis. Overall, she is an active member in the village, and usually goes out to pubs, restaurants or the cinema in Penzance on a weekly basis. She recently moved to a new house in Pendeen and wants to get Internet connection installed at home. She has a fully functional laptop at home, but she mostly goes online through her mobile phone, as she has not been able to get broadband access at home. As a consequence, she spends several hours each week in third places such as cafés that offer free WiFi or at the Centre of Pendeen. Judy expresses mixed feelings about the Internet, describing it as a source of frustration, but she also considers it a great tool to find information. However, sometimes she finds herself wasting a lot of time with activities that are irrelevant for what she is actually looking for. As noted above, she has an active social life, with a circle of family and friends living nearby that she visits and calls on a weekly basis. She keeps in touch with family and friends who live further away mostly through instant messaging and social networks.

Judy expresses a high degree of frustration about the fact that she hasn’t been able to connect to the Internet at home (“I have been trying to get broadband at home for the last three months and still haven’t got it! The Internet cabinet was at full capacity and the demand of an upgraded service was not large enough”). As noted previously, in Chapter 5, once an Internet cabinet reaches its limit, it has no more fibre ports available.
Usually, the number of ports available on a Primary Connection Point (PCP), the green cabinets located aside of the streets where the main lines from the telephone exchange stop, connecting the wires from the customer’s home / office to a pair of wires from the Internet exchange point, would be based on an estimated percentage of homes that need coverage. Extra ports can be added by upgrading the installation through a digital subscriber line access multiplexer (DSLAM) port that allows to connect multiple DSL subscribers to one Internet backbone, but this is an expensive solution usually only applied once a critical mass of applicants requires an upgrade of the service. This scenario seems challenging, as reaching the required number of new users to upgrade the fibre ports system would require an increase of inhabitants requesting the service within the village - an area where development moves more slowly than in larger villages or towns in Cornwall and in consequence attracts fewer people to live there.

Overall, Judy’s case clearly illustrates the concept of interchangeable capitals being involved in shaping people’s access to technologies. On the one hand, she struggles with the spatial penalty of people inhabiting rural and remote areas (spatial capital). Even though she has a great deal of motivation to use the Internet, is aware of relevant services, owns the necessary devices to connect, and possesses the skills to use them, she cannot do so at home, due to the infrastructural constraints of her location. On the other hand, due to her high level of social connectedness (social capital), good mobility (personal capital) and financial resources (economic capital), Judy is aware of alternatives and can afford to access the Internet in different places, such as the cafés that offer public WiFi and the community centre, and therefore she gets connected to the Internet in these third places. Nonetheless, her
household location imposes to her significant additional charges, such as requiring extra time for reaching the places, money to consume goods at the café or to pay to use the service at the community centre and effort to carry around different places her laptop whenever she needs to go online. Moreover, Judy’s ability to access the Internet completely relies on her mobility to travel to any of the aforementioned places. Within a structurally disadvantaged village, Judy is privileged of having different forms of capitals that allow her to overcome the material difficulty imposed by her lack of connectivity at home. As will be detailed in some of the other profiles, not all inhabitants can afford to meet these costs.

7.2.2 Hierarchical needs
Oliver is a 56-year-old Cornish man who recently got relocated to a house in Trewellard, through support from the council, after having been homeless for several years. His financial situation is very challenging, as he is currently unemployed and receives benefits that only cover his bare minimum expenses. As a consequence, he has found it difficult to integrate in the village and to meet new people. Oliver mentions having some friends living in nearby villages and with whom he would meet on a weekly basis and chat on the phone less than monthly. Other than that, he is rarely in touch with family and friends living far away. So far, he hasn’t met anyone else in the village. He mostly spends his days outside going for walks and at home watching television.

Oliver has never used the Internet and does not think that he will get an Internet connection at home in the near future, as he is just getting settled with having a house again. He lives on his own and the only technological devices he has at home are a television and a mobile phone.
that he uses primarily for making phone calls and for texting. When asked about the reasons for not going online, he initially mentions simply not being interested in doing so, but then also expresses that it could in fact be a useful tool for him, but lacking a connection, a computer and the necessary skills to use it he feels hopeless about the idea of going online (“I think the Internet can be a useful tool but so far I haven’t learnt to use it and I don’t know if I will be able to learn it”). In the past, he has had to ask people to complete forms online on his behalf (e.g., at libraries), as he would not know how to find the appropriate pages. Oliver mentions that he could probably get online if needed through the help of family members living elsewhere. In contrast, he is unaware that he could also receive such support at the community centre. He also expresses that he considers the Internet to be very beneficial to access information and to keep people in touch and avoid loneliness, though he feels frustrated about not having the skills to use it, as this could be a major constraint for his attempts to find a job.

Oliver’s situation is quite the opposite to the one of Judy (mentioned above). In the case of Oliver, he lives in a very central location within Pendeen, just a few meters away from the Internet cabinet in Trewellard which still accepts applications for Internet connections, and he is just a few blocks away from the community centre, and the central amenities of the village of Pendeen. But he is completely disconnected from the Internet and the community. While he expresses a general interest and desire to learn how to go online, he is unable to translate this motivation into change, due to his economic and social disadvantage. He has struggled a lot during the past years looking for accommodation, and he has to navigate a very tight budget, so he needs to prioritise other more
This prioritisation reflects a natural hierarchy of needs, whereby activities yielding beneficial outcomes that are abstract and in the distant future (e.g., being able to find a job or meet people online) can only be pursued if more basic and immediate needs have been met. Furthermore, his situation is exacerbated by the fact that he is socially isolated. Due to the lack of social support, he simply does not know where to start when it comes to approaching ICTs and is not aware of any close by support opportunities that could be available to him. This reaffirms the idea that digital disadvantages are commonly compound, meaning that they interact to determine the individual’s level of access, skills, use and outcomes.

7.2.3 Social motivation
James was also briefly mentioned already in Chapter 6. He is 68 years old and engages as a volunteer at the Centre of Pendeen. Until recently, he did not know how to use the Internet and consequently did not have a connection at home. However, he mentions that he has learnt to use the Internet recently in the Hall (referring to the community centre) with the support of other volunteers. Given that he has no Internet access at home, the centre is the only place at which he can get connected and learn to use technology such as a desktop computer or a laptop but also more basic devices such as a mobile phone. He said that at the hall, he found the (social) support to learn new things and to keep active as a mature adult, as he also does volunteer work at the community centre (“I don’t like technology, but I have to recognise it is a complete benefit.
What I mean is that with technology, with Internet and Laptops, we are becoming slaves of our work. You have to be checking all the time what you have to do and if there is something new that you need to finish. But also, technology can have a lot of benefits”). Overall, James mentions using only the more basic services available on the Internet and primarily those for communication (“I am on Facebook, it is great to keep in touch with people from different places. I have been working with Twitter, to understand how it works, but I really don’t like it. A lot of people publishing all the time about everything”). When asked about his thoughts on the recent installation of superfast broadband in Pendeen, he remarks that the signal quality changes substantially depending on one’s location (“If you live too far away from the junction your Internet signal is bad even if you pay for having superfast broadband. The Internet connection is always better if you are close to the junctions of the Internet.”).

The case of James is a remarkable success story of a citizen who was able to learn how to use ICTs at a relatively mature age. It is also remarkable because he decided to do so mainly out of curiosity without imminent economic or social pressures to go online (e.g., to apply for jobs or to stay in touch with family members who moved away). Instead, he simply decided that he wanted to learn something new. Why does it seem so easy for James to learn to use the Internet, whereas it seems as something almost impossible for Oliver? Evidently, their very different levels of social support play an important mediating role: one of the main reasons for James to become interested in getting online is that he sees his friends at the community centre using the Internet (motivational access). The same friends who have encouraged him to go online are the ones helping him to enrol with the silver surfers to gain basic operational
and information navigation skills (skills access), and they have continuously been available to him afterwards when he has struggled with ICTs. This social support has allowed James to consolidate and gradually expand his skillset (usage access). The presence of such a sustainable support system makes the task of acquiring digital skills much more manageable, not only because it provides means to overcome technological challenges, but also because it can play an important role increasing his motivation and confidence.

7.2.4 Overcoming barriers
Within the case study, eight out of the 122 respondents reported to be seriously ill or disabled at the time of the study (~7% of the whole sample). More than half of the disabled respondents reported that using the Internet was their primary way of staying socially connected with the outside world.

This can be illustrated by the situation of Sandra, a 25-year-old woman with a permanent disability. Sandra lives in lower Boscaswell with a young live-in carer who attends Sandra full time and completed the survey on her behalf. She has very limited mobility and problems in communicating verbally. As a consequence, she is unable to work and has great difficulty forming social contacts. For Sandra, the Internet is an absolute lifeline that allows her to communicate with the outside world and to meet new people. She has had Internet connections at home for more than fifteen years and has been going online since then. She is subscribed to a basic Internet service and reports that the quality of her connection fluctuates substantially according to what she is doing online. For example, applications might slow down when she is downloading larger files, or downloads may occasionally fail, which can cause her great frustration.
At her home, she has a satellite television, a music player, a tablet and two working computers. In addition, she also has a mobile phone which she only uses for making phone calls and sending text messages, though she needs support from her carer for this due to her mobility issues. Sandra accesses the Internet mostly at home, but also at the homes of her relatives, at the library and at cafés. Overall, she considers herself a good Internet user who performs regular activities online, such as writing and receiving emails or using social networks such as Facebook. On her leisure time, she watches television daily and goes out to cafés in the village and around with her carer on a monthly basis. The Internet is essential for her life, as it allows her to keep in touch with people and establish new connections.

Adam is another respondent with a permanent disability living in Bocaswell. He is 44 years old and responds to the survey from his window, due to some mobility issues. Adam has had an Internet connection at home for the last two years. He lives together with his wife and his son and all of them are regular Internet users. Their home is subscribed to a basic Internet service and Adam also mentions that the speed of his Internet depends substantially on what he is doing online, so activities like streaming movies or gaming would be much slower than doing basic activities like opening webpages. He has many different technological gadgets at home, from a video camera to a tablet, an e-book reader to a gaming console. At his home, there are three working computers. His mobile phone is another extension to the Internet, as he not only uses it to make and receive phone calls, but also to stay connected and perform diverse Internet-related activities. Adam has been going online for around fifteen years and rates his Internet abilities as good. He is connected all the time and wherever he goes, most of the
time through his phone. He often interacts online with people with whom he shares beliefs and interests, and he has met new people and created friendships with people online with whom he had never interacted face to face. He is a social network user, though not much of a content creator. Instead, he likes to browse around to see what other people are doing. He exercises and reads books on a weekly basis and spends the remaining time with his family and watching television. He has family and friends living nearby with whom he is constantly in touch and has some acquaintances living far away whom he contacts by phone on a weekly basis.

The two cases of Sandra and Adam emphasise that value of digital activities need to be re-evaluated primarily in terms of the subjective outcomes that they yield for individuals. While looking at these examples from a normative perspective, we could easily assess that both Sandra and Adam use the Internet only for rather simple activities that are not typically considered beneficial for personal development. However, in their respective life contexts, these activities lead to very significant outcomes for their personal wellbeing. As such, going online Sandra is able to belong to a community other than the one of the village, while engaging in continuous social interaction without the limitations imposed by her disability. Face-to-face interactions often make her uncomfortable, due to her verbal communication difficulties, but she has much more confidence when interacting online and it is easier for her to meet people with shared interests online than in the village. Likewise, for Adam, the Internet provides a way to overcome his mobility issues, while staying in touch with the outside world, learning new things and meeting old acquaintances and new people. At present, research on the digital divide predominantly focuses on beneficial economic outcomes of online
activities (such as increased chances of employment) and often ascribes corresponding values to different forms of digital activities and skills. However, Sandra’s and Adam’s cases clearly illustrate the problem of such top-down valuations and emphasise the need to consider how different aspects of a person’s identity, such as having a disability, determine the subjective outcomes of online activities.

7.2.5 Limiting social support
Marion and Patrick are a couple in their early 70s that lives in Bottalack. They have moved there for their retirement a few years ago. Patrick used to be an architect, where he used computers on a daily basis. Marion used to be a painter and has little experience with digital technologies. Over the years, they have travelled together around the world, but recently they decided to return to the UK due to Patrick’s chronic illness. They moved to Bottalack, because of its idyllic location, close to nature, and because of the affordability of the neighbourhood in comparison to Penzance or St Ives, expensive touristic hubs, where they do most of their activities. While they have friends and acquaintances around the UK and the world, they do not know people within Pendeen other than their neighbours with whom they chat from time to time. They also do not visit the cafes or Pubs in the village and the only local places they visit regularly are the post office and the gas station. After living abroad for many years, they feel somewhat estranged from the local inhabitants who they perceive as very parochial. They rely on their car for going to restaurants, the cinema, the museums in Penzance or to play snooker with friend in St Ives.
Marion and Patrick have had an Internet connection at their house for around three years. They are subscribed to a basic Internet service and consider their connection fast enough. Marion uses the Internet more than Patrick, but she does not know as much about computers as he does. She also relies on him for transportation if there are any problems with technology at home, as she does not have a driving license of her own. For example, at some point, their laptop was broken for several weeks, but they could not get it fixed, as Patrick was unwell and could not drive to St Ives to drop it off for repair. During this time, Marion was not aware of other places in her local community in which she could access the Internet, as they do not interact much with people in the village. She is familiar with basic forms of Internet use, such as sending emails, but she does not use it for more complex activities and also has no interest in doing so. Given that almost all of their social contacts live outside of their local community, the Internet is a critical mean for her to maintain those connections and stay in touch.

The situation of Marion illustrates an interesting scenario with regard to the role of social support. Patrick shares his knowledge with Marion to enable her to use a technology that she otherwise could not have accessed on her own and achieve valued outcomes such as maintaining social relationships. At the same time, however, the way she has learned to use the Internet is very different from the way James (mentioned above) has learned to do it. Unlike James, who gradually increased his digital skills with the occasional help of his friends at the community centre, Marion only uses very specific applications and relies entirely on Patrick to solve any unforeseen difficulties. Marion is not unhappy with this situation, as she only wants to use said applications (rather than learn about computers and the Internet more generally), but their established
pattern of “proxy use” (Dutton et al., 2005) - whereby Patrick continuously performs certain digital activities on her behalf - leaves her highly dependent on him in order to get connected.

7.2.6 Mediated access
Julia described herself as an ex-user of the Internet. When chatting with her, it soon becomes evident that she relied on her husband as proxy to connect to the Internet. She used to have Internet broadband at home when her husband was alive but discontinued the service after her husband passed away and she does not plan to get an Internet connection again (“When he passed away, I didn’t know how to use it and there was also no one else at home who could use it. (…) My husband used it for work and to send/receive emails, I still have a computer at home, but I don’t touch it”). Julia is retired and does not know many people around other than her family. Her only way to communicate with others is by using her phone. At her home, she has a television, a tablet, and a computer from her husband, though she does not know if it is still working. She also has a mobile phone that she uses mostly for making phone calls and for sending and receiving text messages and pictures. On a daily basis, she watches television and reads books. Julia mentions to consider the Internet a good way to find information and to keep in touch with people. She has family living nearby whom she visits, calls or texts on a daily basis. In addition, she also keeps in touch with family and friends living further distances away. She mentions probably wanting to use the Internet again in the future, though, her proxy person to use the Internet was her husband and she does not know anyone else who could help her with Internet-related matters instead.
Julia’s case is similar to the one of Marion (describe above), as she also used to access the Internet via a proxy. The critical difference is that Julia’s proxy is no longer available, which explains why she is no longer connected. Accessing the Internet has led to positive outcomes for her in the past and would likely do so even more in the present. However, she has lost her access to the digital sphere when her husband passed away, as she did not learn how to go online on her own and she does not have alternative support available. Julia’s (and Marion’s) case emphasise the need to consider not only whether or not a person is connected to the Internet but also the autonomy of their digital activities. Support from proxies can no doubt have very positive effects in the short term (especially in relation to potentially risky activities such as online banking), but it can prevent people from developing sustainable and autonomous forms of access to digital technologies in the long term (Eynon, 2009, Courtois & Verdegem, 2016). Thus, in the context of digital skills trainings, it is of vital importance to empower people to access the Internet independently and not via proxies and that people are aware of and have access to support for digital related matters.

A potential reason for this form of dependence can be seen in the influence of traditional gender roles on Internet access and use. Access to technology and the internet, has for a long time been unequal among men and women, meaning that women have faced higher difficulties in accessing technology and when they have done so were expected to perform more basic tasks than men. This influence of traditional gender roles may interact with other factors such as personality traits (e.g., a low openness to new experiences or a low tolerance for uncertainty) or the level of social support beyond what is provided by the male partner.
7.2.7 Super connected
Ida is 72 years old, retired and lives in Pendeen with her partner. For the past 16 years, she has had an Internet connection at home and has been going online regularly ever since. She is subscribed to superfast broadband and considers her connection to be fast enough. At home, she has several ICT devices such as a smart TV, an e-book reader and tablet and more than three working computers. She also has a mobile phone, which she uses for making phone calls, sending text messages or for browsing the Internet when she is out and about (though, she goes online mostly at home). Ida connects to the Internet primarily through her computers and she considers her own skills to use computers and the Internet as good, based on the activities she regularly performs.

Ida thinks that the Internet provides a great tool for communication and source of information that can make life much easier. She finds easier to be in touch with people online than in person and it allows her to pass the time when she is on her own (though, she also thinks she can waste a lot of time when going online). Several times a day, she checks her email, and she has found numerous friends and acquaintances online several of whom she has never met before face to face. Ida estimates that she has connected with at least 50 people online, most of them are either old friends from school or people with whom she shares the interests in Genealogy and Ancestry. Ida is also very active on different social media (e.g., Facebook), though, she mainly checks and comments on the contents of other people rather than to generate her own. When Ida is not online, she watches television and reads books on a daily basis and exercises on a weekly basis, and she also goes out from time to time. She
has family and friends living nearby that she sees in a daily basis, but with whom she would not communicate online so often. She is rarely in touch with family and friends living far away.

Overall, Ida’s situation illustrates a case where all forms of capital are at comparatively high levels, facilitating her use of the Internet. She lives in a central location and has a high-quality Internet connection at home. Her comfortable economic situation allows her to purchase relevant devices, due to her professional background she also has sufficient digital skills to use them for her purposes, and she is socially well connected within the village. In this situation, it is easy for her to use the Internet in order to diversify her retirement. For her, connecting to the Internet is not a necessity but leisure and she enjoys exploring what online resources are available to her. Like Sandra (mentioned above), using the Internet has allowed her to meet like-minded people with similar interest whom she could not have meet within the village.

7.2.8 Change maker
Elsa, 73 years old, grew up in a major city within the UK and moved to Pendeen to get closer to her husband’s family roots. She lives in the heart of the village with her husband and one of her offspring. Being an outsider who arrived in Pendeen more than a decade ago, she has engaged in and even directed some local community activities, which have enormously improved the vitality of the village. She considers herself a good Internet user and can help others to go online to do some basic tasks. Still, she mentions not feeling confident enough to respond to more detailed questions on how to improve navigation or perform more advanced tasks online. She has different electronic devices at
home, such as a computer connected to the Internet, cable television, video camera, or GPS. She also tries to keep herself active by going for walks, doing gardening and keeping in touch with some other members of the village. She sees the Internet as something indispensable nowadays (“Right now, you can do most of the things using an internet connection, so it’s becoming something compulsory.”). Elsa stays connected with her family and friends living far away through the Internet but also tries to visit them on at least a yearly basis. She is a confident driver who moves around Cornwall in her car, though, she also expresses being concerned about how her life (in Pendeen) will be once she is no longer able to drive anymore because of her age. Elsa has a good network of friends and acquaintances with whom she is constantly in touch through the Internet. She has crowdsourced online with her social networks to secure the funds and labour force for different community initiatives. In this sense, Elsa has come to assume a privileged position within the village. She has the social, economic, and cultural capitals that have allowed her to go beyond the typical activities of a retired woman in a rural village. In a way, she has become a leader capable of instigating local change who has used the Internet to increase her outreach capabilities. Nonetheless, Elsa understands that going online is not easy for everyone (“A good thing about Internet is that you can have access to a lot of information from all over the world! The problem is that technology is going so fast that people are been left behind.”). In general, she thinks that despite the efforts to enhance the Internet infrastructure in the region, one of the big barriers in the village is as basic as receiving a good service that is not spotty all the time (“I have Superfast Broadband at home, but we don’t really understand what exactly we are paying for! We thought that with superfast we were going
to get a better service, but the truth is that Internet still goes off for several minutes as before getting superfast! (Here) the main problem is not how fast I download documents but that the Internet gets disconnected really often and for several minutes. You cannot trust that you will have Internet access when you need it!”).

Overall, Elsa’s case nicely illustrates the potential benefits that digital inclusion can yield in rural areas. She leverages digital resources not merely for her own benefit (e.g., as a means for communication, accessing services or entertainment), but also to support her community by organising social activities and securing public funds to create palpable change in the village.

7.2.9 Overcoming difficulties
Joseph is 46 years old who is unemployed and lives with two further family members in Bocaswell. He does not have an Internet connection at his home but mentions that he is considering getting a service in the near future. Until recently, he was lacking any knowledge regarding how to use the Internet and consequently did not consider ever getting a service at home. However, a while ago he approached the Centre of Pendeen for support and learnt to use the Internet to do online shopping. This has saved him both money and time, as he no longer has to travel to Penzance via public transport. He also mentions that he has gained a lot of confidence in his technology skills and become a regular Internet user and that he probably wants to get broadband access at home in the near future. At his home, Joseph has a satellite television and a gaming console but no working computer. He also has a mobile phone that he uses to make phone calls but also to access the Internet. For example, he
regularly sends and receives messages and photos via messenger services or emails, listens to music, does shopping, or uses applications to find locations. Nonetheless, Joseph considers himself only an occasional Internet user who does very few activities online and only when it is needed (e.g., he is not a social network user). In the future, he would like to use the Internet also as a means to look for work. Outside the digital realm, he keeps in touch on a weekly basis with family and friends that live nearby and tries to do the same with family and friends living far away.

At first glance, Joseph’s case appears very similar to the one of James (mentioned above), as they have both learned to use the Internet with the support of volunteers at the community centre and they were both able to develop a solid set of digital skills that allow them to achieve desired outcomes independently. At closer inspection, however, the two situations are quite different. Whereas James decided to learn how to use the Internet out of mere curiosity, Joseph considers it a necessity that allows him to minimise costs and better manage his budget. Unlike James, he does not consider the Internet as a leisure activity and instead adopts a very focussed task-oriented usage style. This allows him to accomplish his aims, but he does accrue further potential benefits (e.g., he does not acquire generalisable digital skills or form new contacts).

7.2.10 Outdated skills
Rebecca is 83 years old and lives on her own in lower Bocaswell. She has had an Internet connection at home for the last four years. Other than that, she has satellite television, a working computer and a mobile phone that she only uses for phone calls and for text messages. Her daily
activities are watching television and reading books. Rebecca thinks the Internet is too difficult to use and that perhaps it may not be right for people of her age. At the same time, she also expresses feeling like she is missing out on something valuable for not knowing how to use it and that she would in fact she would like to learn how to use it in the future. If she would need to use Internet, she thinks that she could ask her grandchild for help, but she has never needed help on Internet-related matters previously. In the past, she used to know how to use a computer and how to access the Internet but by now she finds both very difficult. The main reason for this is that she does not understand new features of windows that have appeared after software updates. Therefore, she has stopped using it at some point, despite still having the service at home. While she would like to use the Internet again in the near future, she cannot get to the community centre drop-in training, due to mobility issues. She is visited and called by family and friends living nearby on a daily basis and family and friends living far away call her weekly.

Rebecca’s case illustrates another facet regarding the link between social support and digital engagement. Even though she is physically connected to the Internet, and possesses basic digital skills, she struggles to put those skills into action, as the operational demands of her device have changed. This seemingly trivial problem provides a major obstacle that is magnified by to her mobility issues that prevent her from seeking help at the community centre and ultimately lead her to stop going online. Her case underscores that social support needs to be available continuously and in people’s everyday living spaces to enable people to adapt to the ever-changing changing demands of digital technology.
7.3 SYNTHESIS AND DISCUSSION

The most common approach to examine mechanisms that underpin the digital divide has been to rely on big data from national studies to general patterns and trends of digital connectivity and technology enhancement at a large spatial scale. This approach has clear strengths in revealing general trends, but it tends to overlook the socio-cultural particularities embedded within small areas such as the hamlets included in this research. To overcome this limitation, it is not enough to understand how small areas fit into existing descriptions of the urban digital divide, but it is necessary to portray their situation with small data on the liveable experiences of the inhabitants to understand their specific life context and examine the role of digital technologies and inequalities within this context. This is precisely what the current chapter attempted by examining the life narratives of individual inhabitants to provide a window into the mechanisms creating digital inequalities in Pendeen.

The cases of several inhabitants illustrate that remote locations can incur severe spatial penalties when accessing the Internet relative to more central locations. For some people, this meant not being able to connect at all from home. For others, it means that the quality of their connection would be rather poor and/or fluctuate greatly. As detailed in the chapter, many people living in those remote locations do indeed want to access the Internet and have suitable devices and knowledge. However, they are forced to leave their homes to access the Internet in third places instead. For some of the inhabitants, this constraint is manageable. For example, Julia can easily afford to visit cafés several times per week to go online. However, for other inhabitants, going online in third places is not a viable option. Serious illness and resulting constraints on mobility was a prominent issue voiced by the inhabitants that could preclude them from
travelling elsewhere to go online. Others are lacking the economic resources required to travel and consume goods every time they would like to access the Internet. These observations illustrate that Internet access should not be thought of as a dichotomous concept that distinguishes those with and without access, but it exists along a gradation of levels that determine the extent to which the Internet can be used to achieve desired outcomes. For example, according to Helsper (2021), the level of Internet access should be evaluated based on (i) the quality of the available connection(s), (ii) the ubiquity of the available connections, and (iii) the level of autonomy with which it can be used. The results also underscore that different forms of digital disadvantage often interact and can create outcomes that are more than just the sum of its parts. For example, remote spatial locations and mobility issues alone would merely increase the financial and/or temporal costs of accessing the Internet, but the combination of both can result in complete disconnection. Such interactions reflect the idea of intersectionality and signify the need to study Internet barriers in combination and not in isolation (Crenshaw, 1989). Lastly, these observations also emphasise that Bourdieusian and Weberian approaches to digital inequality (e.g., Ragnedda, 2017) which are concerned with different forms of capitals that enable people to access the Internet in different ways, should also consider spatial capital (i.e., the sum of opportunities provided by one’s spatial location to achieve desired outcomes by accessing the Internet) as a critical variable that determine digital capabilities. Evidently, this form of capital is of great relevance for understanding digital inequalities in rural areas.

Importantly, several individuals affected by this lack of access reported to rely quite heavily on the Internet, especially for communication and
the maintenance of social contacts. This underlines the urgent need to improve quality of Internet connection at people’s homes. It also illustrates that the normative view on the digital capabilities gained through the use of ICTs and the Internet is very limited unless it takes individual life circumstances into account, as it would otherwise disdain the appropriation of ICTs by disabled and socially isolated people that may appear shallow on the surface, but for them provides the highest added value of using digital technologies.

In keeping with the previous chapters, the narratives also revealed an important role of social contact and support in the inhabitants’ attempts to find ways to enhance their access to the Internet and pointed to different forms that social support could take. As detailed in previous chapters, one form of support was mediated by the Centre of Pendeen that would provide visitors with both structural access to the Internet and practical support related to using ICTs and finding relevant content. Notably, several inhabitants have taken advantage of this opportunity to acquire solid digital skills that enable them to obtain concrete positive outcomes for themselves. For instance, Joseph cannot afford his own computer or to visit cafés regularly to go online. For him, the community centre has been the only available option to access the Internet, and it has provided him with a way to achieve desired outcomes. Joseph’s case is particularly remarkable, as he is one of the few ‘traditional locals’ (see Chapter 6) who have taken advantage of the support at the community centre, even though the people there are not part of his primary social network. An important avenue for future research will be to understand in more detail what conditions may foster people’s willingness to engage with members of dissimilar social groups in order to exchange knowledge.
and enhance digital capabilities (see Chapter 8 for more detailed discussion).

Interestingly, the analysis also revealed that several inhabitants were connected to the Internet but did not know how to use it. The most common reason for this was the complete reliance on a proxy who used to help with Internet-related activities in the past but was no longer available (e.g., a partner who has passed away). Such cases of learned dependence, where people rely on proxies to solve problems on their behalf rather than acquiring the necessary skills by themselves, illustrate that social support can be a double-edged sword that facilitates initial access but can obstruct people’s need for independent technology use (Courtois & Verdegem, 2016; Eynon, 2009; Eynon & Helsper, 2015; Selwyn et al., 2016). Future research should examine in more detail what learning environments (including aspects of the learner and the instructor) facilitate the acquisition of independent technology knowledge vs. the creation of proxy use (see Dolnicar et al., 2018; Groselij et al., 2019 for initial attempts). This question is of great practical relevance, as technology-related interventions can only have a sustainable impact if they equip participants with meaningful skills that are deep enough to allow them to use technology on their own and flexible enough so they can adapt to changes in the software system.

A final observation from the current chapter is that the group of non-users in the current study was in fact much more diverse than the survey results, presented in Chapter 5, had suggested. Even though none of the non-users reported to have concrete plans to learn how to use the Internet and/or get a connection in the near future, it turned out that this group of respondents was in fact quite diverse with regard to their attitude.
towards technology and their future plans. Some respondents were indeed content in their non-use of the Internet, as they would find it simply irrelevant to their life. Yet, a significant number of non-users mentioned being aware of its advantages and expressed a desire to be able to take advantage of those. As alluded to above, these different perspectives underline how important is to go beyond simple dichotomies between Internet users and non-users (e.g., Helsper et al., 2021; Warschauer, 2003; van Dijk, 2020) and to appreciate the diversity of their life circumstances and needs, which can only be accommodated via differentiated and sustainable interventions and not through “one-size-fits-all” quick fixes.
Chapter 8. General Discussion
8.1 SUMMARY OF CONDUCTED RESEARCH AND CORE RESULTS

This thesis aimed to provide an integrative account of the causes and consequences of differentiated Internet access and use within structurally disadvantaged rural neighbourhoods in Cornwall to inform theories of the digital divide as well as policies and interventions for Internet enhancement.

Throughout the last decades, theories of the digital divide have evolved from an initial focus on physical access to Internet infrastructure (first-level digital divide) toward examining the role of motives, skills, and attitudes (second-level digital divides), toward understanding differential outcomes of online activities (third-level digital divides). This research has traditionally focused on technology use in the urban environment, while overlooking small rural areas, where digital exclusion is being normalised. More recently, studies have attempted to fill these data gaps with ‘Small Data’ collected in rural communities. These studies have provided detailed insight about the challenges experienced by individual inhabitants, but were clearly limited by the small number of considered cases, the narrow focus on singular aspects of digital divides, and a rather normative perspective on the purposes of Internet use. This thesis aimed to overcome these limitations by developing an integrative research approach that examined technology use at multiple levels, with convergent methods, and minimal preconception. Moreover, the research adopted an explicit focus on interactions between variables to document how variables like social capital or internalised technology attitudes could modify the effects of other well established socio-economic variables.
The subsequent sections will discuss the implications of the work presented in this thesis for theories and research on the digital divide (section 8.2), for digital interventions (section 8.3), and for area-based research in the rural environment (section 8.4). Thereafter, limitations and future perspectives of this research will be discussed (8.5) until some final concluding remarks are given (section 8.6).

8.2 IMPLICATIONS FOR THEORIES AND RESEARCH ON THE DIGITAL DIVIDE

This thesis has yielded a number of insights for how the digital divide should be conceived theoretically and how it should be studied empirically. Some of the most relevant areas of impact relate to: the different levels of Internet access, as the term has evolved to include not only who has a connection and who is disconnected but also what people can do when getting connected; the role of social support, as understanding the implication of social contacts for going online can allow for interventions that bridge the digital divide; the influence of a spatial capital, as the spatial location of a household would have a direct impact on the availability and quality of the service received; the role of socialisation, that attends to the influence of socio-historic processes that determine social and individual behaviours with technology; and finally, some subjective outcomes, as a critique to more normative views that assess Internet skills based on what people can achieve online instead of what people derives from their online engagements.
8.2.1 Different levels of Internet access

Despite the recent instalment of Superfast Broadband in the area, an unexpected observation at a very early stage of this research was the low quality of Internet connectivity that the inhabitants of Pendeen were reporting throughout the Rapid Assessment. This observation demanded a strong shift in focus of this research from studying how the sudden increase in technological access would have a (positive) impact in the patterns of life of the village toward studying how inhabitants are managing a very limited (and highly variable) level of connectivity. This observation also illustrates that Internet providers and government initiatives tend to be overly optimistic about the successes of projects focused on enhancing the technological infrastructure and it underscores the need for independent research to be conducted that focuses on the actual experiences of using such infrastructure by those who have been more structurally marginalised (Brouwer and Berkum, 1996; Bock, 2016).

The high variability in the quality of Internet connections experienced by inhabitants across the study site also indicates limitations to the traditional conception of Internet access that merely differentiates users from non-users. While this simple operationalisation facilitates the identification of key factors that distinguish one group from the other (see Chapter 5), it neglects the existence of gradual differences in the varying levels of access within the group of users. Recently, Helsper (2021) has defined Internet access based on the level of quality (i.e., the speed, type and consistency of connections), ubiquity (i.e., the variety of physical spaces in which ICTs can be used), and autonomy (i.e., the freedom to own a device and use it independently in playful manner via trial and error). Whilst this definition of access seems useful and more satisfactory
than simple dichotomies, it presents some challenges at the level of operationalisation, as the relevant concepts likely need to be redefined on a regular basis to properly reflect the changing state-of-the-art. For example, what is considered a high-quality connection might change considerably over time and as a function of the activities that are developed online (e.g., in the late 1990s, with an optimal Internet connection, a four-minute WAV format song (42MB) would have taken roughly three and a half hours to download, while the same song can be downloaded in a matter of seconds with the current average Internet speeds). Moreover, autonomy is a very important but also somewhat fuzzy concept that is difficult to define precisely and that can change according to the life stage and the capacity to follow up with technology progress (e.g., an early SPSS user from the 1970s who has stopped using the software would find virtually impossible to use current versions of the software without additional training). Overall, these considerations illustrate that even careful and multi-layered definitions of access struggle with the challenge to adapt its operationalisation to a dynamically changing digital world. As a consequence, future studies should be careful when providing definitions of Internet access, as these definitions may need to be constantly redefined based on the evolution of the Internet, the activities that can be performed in it and the users, so they should be justified based on the particularities of the evolving theoretical framework.

Results of the current study also support previous conclusions that closing the gap in access to infrastructure (through the provision of fibre optic cables, telephone exchanges, and/or mobile Internet access) is only a first step towards reducing digital inequality (Selwyn, 2002; van Deursen & van Dijk, 2015). Consistent with previous findings, the survey results
revealed important roles of digital skills and attitudes toward digital technologies in predicting the likelihood and the amount of Internet use. Interviews furthermore confirmed that several inhabitants who owned devices to connect to the Internet did not use them, e.g., because of changed demands after software updates. These findings illustrate the sequential nature of digital inequalities (van Deursen et al., 2017), whereby it is easier to develop digital skills once a good level of access is available, and it is easier to engage broadly with technologies and obtain beneficial outcomes with more advanced digital skills. In other words, what people can accomplish by using the Internet depends on their starting conditions and the resources that are available to them to evolve with the demands of the technology. Hence, even though enhancing infrastructure to provide everyone with high-quality access is a laudable aim, it should be clear that it does not provide a level playing field on its own.

8.2.2 Social support and the digital divide

As seen in research developed on urban areas (Asmar et al., 2020), one of the most important observations in the current study concerns the link between the levels of available social support and digital engagement. The survey data showed that individual differences in social support predicted both the likelihood of using the Internet at all and the amount of Internet use. Importantly, these effects were obtained using two different operationalisations of social support and in the presence of numerous competing predictor variables. Thus, the observed effects of social support can be considered robust and warrant further examination.
The observations and interviews with local inhabitants were instrumental in revealing the different forms that this social support could take. For some inhabitants, the presence or absence of support would be in the form of a proxy user who would use the Internet on their behalf or guide them through a set of basic activities. For others, support was tied to local contacts and third places (the community centre or the library) being available to provide high-quality connections, suitable devices, or support with more challenging activities. Interestingly, for some inhabitants, having social contacts outside of their primary social group within the village turned out to be very valuable for getting connected. Along the same lines, social science research has distinguished different forms of social capital (Putnam, 2000). Within this framework, bonding capital refers to a person’s social connections with other people that are perceived as similar. It involves high levels of trust, feelings of closeness, and frequent interactions. By contrast, bridging capital refers to a person’s social connections with people that are perceived as dissimilar. It usually does not involve strong emotional connections and only occasional interactions. The cases of Joseph and James, detailed in Chapter 7, illustrate the effective use of bridging capital. Both are traditional locals who establish social contacts primarily with people who have very limited exposure to digital technologies and show very little interest in it. However, Joseph and James both have additional contacts who are volunteers at the community centre and can provide them with important resources (e.g., access to a high-quality connection and support in developing solid digital skills) that enables them to use the Internet and to obtain valued outcomes. Other traditional locals might benefit similarly from the same online activities, but they do not consider
this, as they lack the same social connections across the main social groups within the village.

An interesting perspective for future research will be to look more closely at the respective roles of bridging and bonding capital and how they relate to differences in Internet use. One possibility, suggested by Chen (2013), is that bridging capital might be more important for the diffusion of new technologies across social groups, whereas bonding capital might be more important to consolidate skills and optimise the outcomes of digital activities. This conception of bridging capital is consistent with evidence that the vast majority of Internet non-users has no family members who use the Internet (Smith 2010; and see Chapter 5) and that community members with the lowest level of bridging capital tend to be the last to adopt new technologies (Rogers, 1995). The conception of bonding capital also appears plausible, as close social contacts would generally be more reliable and more willing to provide support continuously (Uzzi, 1996; Steffanone et al., 2011). At the same time, the relative importance of bonding and bridging capital may differ across individuals and depend upon the resources available in their primary social group. For example, in the current study, bridging capital appeared to be advantageous primarily for traditional locals, who otherwise had few resources available related to going online, but not for the members of the other social groups. In the long run, research should also go beyond establishing links between forms of capital and digital engagement and toward explaining those links via specific mechanisms. Different mechanisms might be responsible for effects of different forms of social capital, e.g., increased exposure to new technologies, peer pressure to use ICTs (e.g., for communication in social groups), or
genuine support with digital activities, calling for precise measurements and theorisations to tease apart their respective contributions.

Another interesting area to explore is how rural areas that were already disadvantaged had to quickly adapt to using digital technologies during the Covid-19 pandemic, and how they overcame the multiple challenges faced by their populations. The development of collaborative and support networks, as well as the practical lessons learned during this global and local crisis, could be incredibly valuable in informing future policies and interventions aimed at bridging the many divides faced by these areas in the present and future.

8.2.3 Territories and places and the digital divide

Another variable that turned out to be very relevant for digital engagement in Pendeen was the spatial location of inhabitants’ homes within the study site. The proximity of their houses to the closest available cabinet would in some cases determine whether or not a connection would be available at all, and in other cases what quality of connectivity could be achieved. As explained in previous chapters, the quality of broadband connectivity is not ubiquitous but is directly influenced by a spatial component. As such, the Internet speed can suffer from different forms of degradation when travelling from the local exchange to the residential premise which will depend on the type of connection (cables) that provide the service (Chapter 4) furthermore, in some instances, is not even possible to get subscribed to broadband service if the Internet cabinet that is expected to provide the service to an area had reached its limit of connections to residential premises (see the case of Judy in
Chapter 7) In that sense, when no connection was available at all, inhabitants were forced to leave their homes, incurring different costs to get connected elsewhere. When a connection was available, inhabitants could potentially go online at home, but only with low speed and frequent interruptions, often leading to negative experiences and a rather narrow focus on using the Internet only for absolute necessities.

These findings suggest that the spatial location of a person’s home should be considered a relevant form of capital that could influence their digital capabilities. As illustrated by the examples above, such ‘spatial capital’ is interchangeable with other forms of capital, as the penalties of remote locations could be mitigated via investment of other capitals to determine the level of autonomy at which the Internet can be accessed. Accordingly, capital-based theories of the digital divide (Meyen et al., 2010; Ignatow & Robinson, 2017; Regnedda, 2018) should include spatial capital as a variable, especially in studies of the rural environment where the impact of spatial penalties can be profound. More generally, the observed interactions among different person variables (such as their spatial location, social support, mobility, etc.) imply that future research should focus less on the role of individual predictor variables and more on more on the mechanisms that produce compound digital inequality.

A question that comes to mind within this context is whether social or spatial capital is ultimately more important for digital engagement. The findings presented in this thesis suggest that social capital might be more critical in determining whether or not a person will engage with digital technologies at all, whereas spatial capital is more important in determining people’s level and style of engagement. However, as noted
above, the effects of these two spheres are ultimately interactive, due to the interchangeability of different forms of capital.

8.2.4 Socialisation and the digital divide

Chapter 6 provided a comprehensive analysis of Pendeen’s history as an industrial region whose economic and social prospects have risen and plummeted together with the mining era. The analysis showed that Pendeen’s past continues to affect the present as part of a structural rural marginalisation process (Brouwer & Berkum, 1996). At this structural level, Pendeen has become a conservation area that exploits the remaining foundations of its mining past to attract tourists during the short summer periods. In terms of Baudrillard (1981), the village with its stone wall cottages, its mining museums, and its ‘workers’ dressed up like miners has become a simulacra that masks the ‘real’, a simulated copy that has superseded the real image of a village in decline. Importantly, preserving these mining settlements from the past has placed severe constraints on possible infrastructure improvements in the village. It must be remembered that the simulacra is the inverse of representation, in fact, it is the ‘death’ of the sign. In the case of Pendeen, the system provided a ‘representation’ of the past with its mines, stone cottages and people dressed up like miners that shadow the reality of the decay of a once flourishing mining village. Masking the reality of such decay in a performance that ‘preserves’ a death past into the present is the way in which the system preserves itself of any critique.

At the community level, there was also a great stability in the patterns of life among those inhabitants with longstanding family ties in the village, as reflected in their occupations, social activities, and beliefs about their
place in society and the role of technology therein, often resulting in statements like “the Internet is just not for someone like me”, when referring to how the Internet did not fit within their everyday activities. As detailed in Chapter 6, these views were in strong contrast to those of inhabitants who had spent most of their lives in urban areas, where the digitisation is at a more advanced stage, and relocated to Pendeen more recently.

These findings indicate an important role of socialisation processes in shaping people’s internalisations about the world (Gerth & Wright Mills, 1953) that also affect their valuation of technology. Such a perspective seems helpful to explain the wide-spread reluctance among inhabitants to even consider engaging with ICTs, as they were perceived as part of an urban lifestyle that appeared strange to them and reminded them of their own perceived lower rank in society. In this context, while some research has already pointed out the importance of fit-for-purpose broadband in promoting digital inclusion for individuals (Philipa & Williams, 2018), technology would only be approached if specific life conditions would make it seem worthwhile (e.g., to provide children with educational resources, to diversify the job market options, or to be able to communicate with relatives and acquaintances who had moved away).

Overall, these findings suggest that current theories of the digital divide focus too much on the status quo by examining mainly how people’s current beliefs and attitudes about technologies relate to their digital engagement. Instead, understanding how the beliefs on technology use are formed, maintained, and altered through “recurrent interactions” which form “patterns of mutually oriented conduct” (Gerth & Mills, 1953) should become a key area of research.
This proposition resonates very well with recently developed ecological theories of digital inequalities (Helsper, 2021, Kral, 2014; Mossberger, Tolbert, & Lacombe, 2021) that advocate for a shift toward meso-level analytic scales to examine how human relationships and everyday life in communities, shapes people’s identities and determines their perception of and engagement with new technologies.

8.2.5 Subjective outcomes

Results from the current study also emphasise the urgent need for researchers to avoid using top-down definitions of supposedly desirable digital skills and digital activities. Certainly, there has been a huge progress from the time in which Internet skills were measured based on the technicalities or ‘button knowledge’ of Internet use (e.g., Bunz, et al., 2007; Hargittai & Hsieh, 2012), and nowadays Internet skills are understood as a more elaborate concept that should include the operational skill, necessary to use the Internet, and the information skills, required to comprehend and use online content (van Deursen & van Dijk, 2009, 2010, 2011 Gui & Argentin, 2011; Helsper, 2008; Mossberger, et al., 2003) to avoid a merely technologically focused approach.

While the late skills definitions are broader, they are often derived from labour market demands, neglecting the first-person perspective of the users for which those demands may appear irrelevant. In contrast, the current study documented that supposedly ‘shallow’ digital activities, that seem of little value for personal development or ‘employability’, could yield very important outcomes for individuals by satisfying some fundamental human need such as providing them with a sense of belonging. For Sandra and Adam (described in Chapter 7), engaging in
gaming or chat rooms became a major source for communicating with others, increasing their social resources as a way to compensate for their difficult living conditions, greatly enhancing their well-being. Considering these observations, future research on the digital divide needs to consider a broader range of outcomes variables that include psychosocial valuations of digital activities. Such a shift in the considered outcomes variables would also imply a shift in the considered digital skills that are needed to achieve those outcomes, as both are likely to vary considerably between populations and individuals.

8.3 IMPLICATIONS FOR DIGITAL INTERVENTIONS

In addition to informing theorisations of the digital divide, the current study also provided rich insight about the diversity of motives to use the Internet among the inhabitants as well as about the practical barriers they encountered along the way. These observations have clear implications for the way future interventions seeking to reduce digital inequality should be conducted, generally emphasising the need to avoid normative top-down approaches and instead adopt more horizontal approaches that allow to tailor interventions based on the local needs, practices and culture of particular areas. This would have an effect on the different levels of intervention, e.g., the setting and staff of the intervention; the nature of the covered digital activities and skills; the definition of target outcomes, evaluation criteria, and feedback mechanisms; or the nature of the support system that inhabitants receive. In the following paragraphs I will discuss specific implications for each of those aspects.
In general, when conducting interventions with vulnerable communities, it is very important to remember that the participants (and not the researchers) should be at the centre of the intervention and therefore, participants should have a chance to approve of how their voices are being portrayed and researchers should be accountable for their work or the lack of delivery on it. It was documented how previous research conducted in Pendeen, aimed to be delivered as interventions, ended up working just as installations for researchers. However, both approaches widely differ from one another. According to Fraser, M.W., Galinsky, M.J. (2010) a research intervention is the systematic study of purposive change strategies, while the installation, a common practice in Architecture schools, is the act of installing something in a fixed, semi-fixed or temporary location and analysing the engagement of the audience with the object. This practice can be very problematic when used to approach vulnerable communities that are not aware what their role in the research is and how their responses will be interpreted or muted by the researcher.

In the end, these experiences had left the inhabitants with very negative impressions, e.g., because researchers were inexperienced working with vulnerable communities and failed to deliver workshops that were promised at the outset of the study, or because they would openly label inhabitants as ‘poor’ or as belonging to ‘deprived neighbourhoods’ and not being transparent about what collected data would be used for. These studies, funded by Superfast Cornwall, subsequently published articles claiming that their interventions had successfully engaged the local populations, demonstrating the ‘success’ of the broadband enhancement in the region. This obvious disconnection between the perspectives of the researchers and the inhabitants’ perspective points
toward several problematic issues related to open access: firstly, the results from intervention studies in rural areas should be made accessible to everyone, so participants can evaluate themselves to what extent they constitute a ‘success’ story. Secondly, communities should have access to how their information is used in research and informing policymaking. Finally, communities should be made aware clearly if there could be any conflict of interest from the funding bodies to showcase the reality of the digital divide in their area. Following these principles would enhance inhabitants’ trust in the usefulness of interventions and their impression that researchers have a genuine interest in generating positive outcomes for their communities and not just in gathering data for themselves.

Along the same lines, the current study suggests that interventions need to focus not merely on teaching people a set of supposedly desirable technical skills in the form of one training serves a whole region (e.g., how to prepare a CV or to create a direct debit account for utility bills) but instead focus strongly on activities that attendants would actually like to conduct with digital technologies. For example, predominant motives for the use of the Internet in the current study were the needs to stay in touch with friends and family living far away or to use online shopping in order to save money and avoid unnecessary travel. Accordingly, interventions should aim to identify such concrete motives and attempt to enable attendants to accomplish these goals as soon as possible. Such experiences of goal achievement will likely increase their levels of confidence, motivation, and satisfaction with technology, while avoiding the setting of being in a classroom lecture with a standard curriculum. Developing attendant-focused curricula will no doubt be challenging, but the current study suggests that they would be more likely to foster
positive experiences, intrinsic motivation, and ultimately autonomous use of ICTs.

A serious challenge for interventions that was observed in the present study was the existence of social segregation in the study site, whereby people from different backgrounds were living largely separated lives. Specifically, traditional locals whose families have lived in the area for generations would rarely interact with newcomers - who would either live in isolation or will interact only within their own community - or with young commuters whose social life takes place in the larger Cornish towns and who merely live in Pendeen for its affordable housing prices. This segregation meant that community efforts on digital engagement, which were initiated by the socially engaged newcomers, would go largely unnoticed by traditional locals or by more secluded newcomers. Considering these profound effects of social group membership, interventions should aim to engage local inhabitants that are connected with and trusted by members of different social groups. If available, such inhabitants may be able to serve as relatable role models that could help promote activities to everyone within the village and create more positive perceptions about the usefulness of new technologies.

The current study implies that it is important that inhabitants access ICTs in their everyday living spaces and not just in public community or educational spaces, where interventions might take place. Otherwise, interventions will likely disadvantage people with spatial penalties and/or mobility issues. Furthermore, peer support should be available to attendants continuously after the intervention at a low contact threshold, ideally from trusted local peers (see above). Otherwise, inhabitants may struggle to maintain their new knowledge in the face of changing
demands, e.g., due to software updates or new applications, and may disengage when new problems are encountered.

Lastly, the current study suggests that interventions need to be mindful about the usage style they seek to support in their attendants. As alluded to above, several inhabitants of Pendeen exhibited a persistent pattern of proxy use. This usage style may be adaptive in some situations, e.g., for people with limited interest in technology who need to perform specific high-stakes activities such as making bank transfer. However, interventions aiming to empower their attendants to use the Internet autonomously should try to avoid establishing patterns of proxy use.

8.4 METHODOLOGICAL IMPLICATIONS FOR RESEARCH IN RURAL AREAS

Beyond its implications for research and interventions on digital inequalities, the current study also bears relevance for empirical studies of small areas even outside the realm of digital inequality.

As such, the current study clearly suggests the critical importance of conducting qualitative pilot studies prior to more comprehensive data collections. The Rapid Assessment that was conducted in the first study phase turned out to be absolutely essential for multiple reasons. Firstly, it provided an understanding of the state-of-the-art surrounding digital technologies, which led to a redefinition of the study’s scope (see also section 7.2.1) and guided the development of suitable instruments and the interpretation of data at later stages. Secondly, it provided a chance to build an initial infrastructure for the second study phase (e.g., informants, localities) and to become aware of practical issues that would affect more comprehensive data collection (e.g., the difficulties of
moving around the dispersed settlement). Lastly, it was absolutely necessary to earn the inhabitants’ trust and motivate a critical mass to participate in the study. As mentioned in the previous section, previous research done in Pendeen left the inhabitants with bad experiences. Therefore, it turned out to be very important to allow the inhabitants to express themselves freely and through a variety of activities to understand their reservations about research and their needs with regard to technologies, gaining their trust in the process. Among the conducted activities, interactive activities (e.g., focus groups) that would encourage inhabitants to discuss and imagine roles of ICTs in their community were particularly productive. By contrast, individualised and written exercises were less productive, as they were perceived as less engaging, and turned out to be rather difficult to analyse (e.g., due to very different interpretations of the questions). Overall, these experiences suggest that co-creative activities are very well suited to build meaningful connections with local inhabitants and to obtain bottom-up insights about their everyday life experiences.

The methodology used in the second study phase could also provide general guidance to future research in rural areas. For instance, the study survey was conducted via face-to-face household visits, which was challenging, as dispersed areas had to be covered with often multiple visits of each household. Nonetheless, these efforts appeared to be worthwhile, as the face-to-face interaction clearly increased the inhabitants’ motivation to participate (as they would prefer talking with a real person over completing a questionnaire) and maximised the accuracy of the information obtained (e.g., because inhabitants could ask for clarification when needed). These interactions also allowed for metadata to be collected that would facilitate the analysis and
interpretation of data at a later stage. Collectively, these experiences clearly suggest that face-to-face surveys should be the preferred method whenever the budget of a research study permits it.

At the same time, the current study emphasises that survey data alone are limited and should be amended and contextualised via additional data sources, such as observation and interviews. The multi-method approach of the current study was rather exploratory but the ability to relate the standardised survey results to lived experiences allowed to enrich and expand the conclusions (e.g., about the link between social support and digital engagement or the different levels of Internet access, as discussed in section 7.2). Needless to say, qualitative research methods also have clear limitations (see next section). While they tend to provide more detailed and contextualised insights, it can often be hard to distinguish anecdotal evidence from reliable patterns. Therefore, the convergent use of qualitative and quantitative methods promises to provide the best of both worlds and a window to obtain more integrative insights about mechanisms that underlie social inequality in rural areas.

A final methodological implication of the current study relates to the collaboration with local third places as a means to facilitate the access to the study site and maximise the participation turnout. In retrospect, this approach should be considered with caution. It can certainly be helpful in bridging the distance between researchers and local inhabitants and maximise the turn-out of exploratory activities in pilot studies. However, as detailed in Chapter 6 and Chapter 7, access to third places is far from equal for all the inhabitants. Concentrating study activities in these places, therefore, creates a risk of introducing sampling biases and of
hindering the collection of truthful individual details from isolated and/or stigmatised members of the community.

8.5 LIMITATIONS AND FUTURE PERSPECTIVES

The current study presents several limitations worth noting that will be discussed in the following section and that should inform and encourage future research on digital inequalities in rural areas.

A first limitation concerns the size and composition of the study sample that participated in the household survey (see Chapter 5). Extensive efforts were undertaken to maximise the size and representativeness of the sample by approaching every household in the study site on several occasions. In the end, the final sample with 122 participants was much larger and more diverse than those of most previous investigations of digital inequalities in rural areas, see Chapter 1. Nonetheless, it is acknowledged that the sample of this research was not fully representative of the local population (as evidenced by differences in the demographic composition of the sample and the area’s census data). Specifically, a bias was observed, whereby older adults (especially retirees) were slightly overrepresented in the study sample, and younger adults (especially those who are employed) were slightly underrepresented. Notably, the sampling bias was rather subtle in magnitude and the sample approximated the population characteristics quite well on the whole. Nonetheless, the presence of a sampling bias clearly limits the generalisability of conclusions that can be drawn from survey data. In addition to representativeness, it should be noted that the study sample turned out to be too small for some quantitative analyses (e.g., effects of compound disadvantage) that would have required
further sub-division of the whole sample. Future research could tackle this issue using qualitative comparative analyses, as this method allows to examine causal contributions of compound conditions for a specific outcome (in this case, digital connection/disconnection) with a limited number of observations (Ragin, 2008, 2000). This method also allows to assess which conditions are necessary for the outcome to occur and which conditions are sufficient for the outcome to occur, based on the information retrieved by the cases of the sample.

A second limitation worth noting relates to different types of data that were not collected within the current study but that might have been helpful to gain more detailed insights into the mechanisms creating digital inequalities in Pendeen. For example, as noted above in Chapter 3, a potentially very informative variable to consider would have been differences in socio-economic status between the inhabitants of Pendeen (and ideally also between their respective social contacts). This would have allowed to examine relationships between digital and traditional forms of inequality more closely. However, as mentioned in Chapter 3, the personal informant that supported the data collection strongly advised against attempting to collect such information, as participants would likely feel very uncomfortable and afraid of being stigmatised, which would have resulted in a decreased participation rate and a much more severe sampling bias. Thus, a challenge for future research in rural areas will be to find ways obtain information about socio-economic variables without alienating participants along the way. Beyond socio-economic status, a number of additional variables could have proven useful. For example, in an ideal scenario, digital skills and Internet use would not solely be measured via self-report (i.e., by asking inhabitants to rate their own level of skills or to describe their patterns of use), but
also be validated through objective data about actual usage patterns. These data were not available to the current research project, but could prove valuable for future research, e.g., by providing more accurate operationalisations than self-report (e.g., self-reported skills might reflect confidence rather than actual skills) and in determining locations and times of maximal Internet use in a data-driven manner.

A related limitation of the current study concerns variables that were in fact collected but (in retrospect) could have been measured in more refined ways to permit more detailed analyses. As noted above, concepts such as Internet access, digital skills, or social capital are all very broad and difficult to operationalise precisely and exhaustively. For instance, several scholars have argued that digital skills are not a homogenous concept and that engagement with the Internet instead draws upon a set of connected but ultimately distinct capacities (e.g., technical skills, information search skills, critical information evaluation skills, social interaction skills). Future research should attempt to go beyond establishing general links between the levels of skills and the Internet use (as reported in Chapter 5) and examine how such specific forms of digital skills are related to outcomes of Internet use in different life domains.

Along the same lines, the analysis of the survey data was guided by a rather traditional conception of Internet access that distinguishes merely between users and non-users. This operationalisation was useful, at a practical level, to establish clear socio-demographic profiles of variables that are related to Internet use, but ultimately, it does not do full justice to the varieties of access issues that were observed in the subsequent interviews and observations. In a similar vein, future research may also attempt to use more specific operationalisations of social capital, e.g., by
using separate measures for bonding capital and bridging capital (van Deursen et al., 2017).

A final aspect of the study worth emphasising is that it could only provide a cross-sectional snapshot of digital inequality in Pendeen at one particular moment in time. Future research would benefit enormously from more longitudinal research that is capable of following both individuals and entire communities over time during process of digitisation to examine the causes and consequences of digital inequalities in rural areas.

8.6 CONCLUDING REMARKS

In principle, digitisation has enormous potential to mitigate structural disadvantages of rural areas by reducing spatiotemporal constraints on the access of knowledge and services and by providing new opportunities for accessing, using and producing content, knowledge and services within a wider spectrum. In reality, however, inhabitants of rural areas continue to be systematically disadvantaged in their access to new technologies, preventing them from participating in an increasingly digitised society, which amplifies their pre-existing levels of inequality. Therefore, understanding the pathways and barriers to technology use in rural areas represents a pressing question that demands targeted and situated research.

This thesis was conducted to contribute toward this aim and elucidate about the mechanisms that create inequalities in the access and use of ICTs in the rural environment. While several important insights were gained that should encourage further investigation, this thesis also
illustrates the great challenges that are associated with conducting research in rural areas. Most evidently, data collection in rural areas is far more challenging due to a combination of obstacles (e.g., the dispersed nature of rural settlements, the lack of suitable guiding frameworks and measurement instruments, or the high level of scepticism toward academic research among the inhabitants). These obstacles can restrict the types of questions that can even be addressed via fieldwork and the strength of the conclusions that can be drawn from the collected data. Perhaps even more critically, a clear tendency was observed, whereby those inhabitants who may have the greatest potential to benefit from new technologies were the least likely to engage with digital initiatives. With these challenges in mind, it would be easy to become pessimistic about the prospects of digital interventions as a way to unlock the Internet’s potential to reduce (rather than amplify) social inequalities. At the same time, the life narratives of individual inhabitants clearly suggest that these efforts can be worthwhile and could create significant opportunities for individuals to enhance their life expectancies. Evidently, understanding the mechanisms that perpetuate inequality is a prerequisite for challenging the status quo and ultimately for implementing change. It is my sincere hope that this thesis can provide a small contribution toward this end by collecting missing data within disadvantaged communities, by broadening the research scope to include new concepts and by developing procedures that allow inhabitants to express themselves freely and actively shape the unfolding research process. Incorporating these elements into future research could facilitate overcoming some of the aforementioned challenges, especially by enhancing inhabitants’ motivation to engage with digital initiatives if they anticipate that projects are done in their interest and
that they may yield tangible outcomes for them. Digital divides represent great challenges for our societies, but they can be tackled through well-designed collaborative efforts from citizens, scientists, and policy makers.
References
References


Albert, W., Tullis, T., & Tedesco, D. (2009). Beyond the usability lab: Conducting large-scale online user experience studies. Burlington, MA: Morgan Kaufmann.


DiSTO (2023). From Digital Skills to Tangible Outcomes (project page) Accessed 11/01/2023
https://www.lse.ac.uk/media-and-communications/research/research-projects/disto


Penwith District Council (2012a). Cornwall Industrial Settlements Initiative BOTALLACK and TRUTHWALL.

Penwith District Council (2012b). Cornwall Industrial Settlements Initiative CARNYORTH.

Penwith District Council (2012c). Cornwall Industrial Settlements Initiative TREWELLARD (with Jubilee Place).

Penwith District Council (2012d). Cornwall Industrial Settlements Initiative PENDEEN and LOWER BOSCASWELL.

Penwith District Council (2012e). Cornwall Industrial Settlements Initiative BOJEWYAN.


Ragin, C. (2008). What is Qualitative Comparative Analysis (QCA)?, Department of Sociology and Department of Political Science, University of Arizona.


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Willis, K. (2019). 'Making a 'Place' for ICTs in Rural Communities: The role of village halls in digital inclusion', C&T '19: Proceedings of the 9th International Conference on Communities & Technologies - Transforming Communities: 136–142.


Appendices
Appendix 1. Ethical Approval & Information/Consent Sheets

Dr Ava Fatah gen.Schieck
Bartlett School of Graduate Studies
UCL

26 August 2014

Dear Dr Schieck

Notification of Ethical Approval
Project ID: 6028/001: Internet and urban media for social neighbourhoods: broadband in rural villages of Cornwall

I am pleased to confirm in my capacity as Chair of the UCL Research Ethics Committee I have approved your study for the duration of the project i.e. until September 2015.

Approval is subject to the following conditions:

1. You must seek Chair's approval for proposed amendments to the research for which this approval has been given. Ethical approval is specific to this project and must not be treated as applicable to research of a similar nature. Each research project is reviewed separately and if there are significant changes to the research protocol you should seek confirmation of continued ethical approval by completing the ‘Amendment Approval Request Form’.

The form identified above can be accessed by logging on to the ethics website at: http://ethics.grad.ucl.ac.uk/ and clicking on the button marked ‘Responsibilities Following Approval’.

2. It is your responsibility to report to the Committee any unanticipated problems or adverse events involving risks to participants or others. Both non-serious and serious adverse events must be reported.

Reporting Non-Serious Adverse Events
For non-serious adverse events you will need to inform Helen Dougall, Ethics Committee Administrator (ethics@ucl.ac.uk), within ten days of an adverse incident occurring and provide a full written report that should include any amendments to the participant information sheet and study protocol. The Chair or Vice-Chair of the Ethics Committee will confirm that the incident is non-serious and report to the Committee at the next meeting. The final view of the Committee will be communicated to you.

Reporting Serious Adverse Events
The Ethics Committee should be notified of all serious adverse events via the Ethics Committee Administrator immediately the incident occurs. Where the adverse incident is unexpected and serious, the Chair or Vice-Chair will decide whether the study should be terminated pending the opinion of an independent expert. The adverse event will be considered at the next Committee meeting and a decision will be made on the need to change the information leaflet and/or study protocol.

On completion of the research you must submit a brief report (a maximum of two sides of A4) of your findings/concluding comments to the Committee, which includes in particular issues relating to the ethical implications of the research.
Amending an Approved Application

Should you wish to make an amendment to an approved study, you will need to submit an 'amendment request' for the consideration of the Chair of the UCL Research Ethics Committee. Applications can only be amended after ethical approval has been granted.

You will need to apply for an amendment approval if you wish to:

1. Add a new participant group;
2. Add a new research method;
3. Ask for additional data from your existing participants;
4. Remove a group of participants or a research method from the project, and have not yet commenced that part of the project;
5. Apply for an extension to your current ethical approval.

If you need to apply for an amendment approval, please complete the Amendment Approval Request Form on the next page.

When completing the form, please ensure you do the following:

- Clearly explain what the amendment you wish to make is, and the justification for making the change.
- Insert details of any ethical issues raised by the proposed amendments.
- Include all relevant information regarding the change so that the Chair can make an informed decision, and submit a copy of the sections of your application that have changed with all changes highlighted/underlined for clarity.
- You do not need to submit your original application in full again. However, if the changes you wish to make alters several sections of your application form, you are advised to submit this.

One signed hard copy of the form (and any amended documents), as well as an electronic copy of these same documents must be submitted to the REC Administrator to the address detailed below:

Administrator of the UCL Research Ethics Committee
Academic Services
1-19 Torrington Place
UCL
London
WC1E 6BT

Email: ethics@ucl.ac.uk

Amendment requests are generally considered within 5-7 days of submission.
Information Sheet

“Internet and Urban Media for Social Neighbourhoods: Broadband in Rural Villages of Cornwall”

This study has been approved by the UCL Research Ethics Committee (Project ID Number): 6028/001

INVITATION

You are being invited to take part in a research study assessing to identify how the implementation of Internet broadband access can influence alterations in the everyday social lives of the residents of rural neighbourhoods in Cornwall. The study seeks to understand the ways in which village dwellers perceive modifications in their interaction patterns in the local, physically and mediated through the use of communication and information technological devices. This information will allow us to enlighten the potentialities and risks of Internet-based technologies to generate adjustments in the structures of social cohesion and sense of belonging of the residents of rural villages in Cornwall.

This PhD research is being developed by the Bartlett School of Graduate Studies of the University College London and is supported by the project Sustainable Digital Neighbourhoods at Plymouth University.

WHAT WILL HAPPEN

In this study, you will be asked to answer a set of questions related to the perception of your space of belonging and its relationship with the use of different Internet-based and communication technological devices. You will not be asked any personal or sensitive information which could be used to identify your questionnaire. Your answers will be treated in complete confidence and it will not be possible to identify your responses in any published materials.

TIME COMMITMENT

The study typically takes between five to ten minutes. You can complement your response with any written observation that you think could improve the results of the research and/or you can participate in an extended interview where you could broaden your responses to the questionnaire.

PARTICIPANTS’ RIGHTS

You are under no obligation to answer any question here, although it would be valuable if you felt able to complete it. As participation is anonymous it will not be possible for us to withdraw your data once you have returned your questionnaire. Submission of a completed questionnaire implies consent to participate. Feel free to ask questions at any point.

BENEFITS AND RISKS

This study poses no known risks to you and would allow us a better understanding of the effects that Internet accessibility and its use can have in the sense of belonging to physical and symbolic spaces (neighbourhood, parish and community) in the rural villages of Cornwall.

COMPENSATION

Your participation in this study is voluntary.

FOR FURTHER INFORMATION

We will be glad to answer your questions about this study at any time, and we can inform you about the results of the study once data collection is complete.

You may contact us at:

Primary Researcher: Aya Fahdi gen. Schieck
Contact: afa@ufc.ac.uk

PhD Researcher: Abdi Herrera Chavez
Contact: ahc@ufc.ac.uk

Plymouth University Researcher: Dr. Katherine Wilks (ML, Alessandro Avalli)

All data will be collected and stored in accordance with the Data Protection Act 1998.

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Consent Sheet

“Internet and Urban Media for Social Neighbourhoods: Broadband in Rural Villages of Cornwall”

Please complete this form if you want to participate in an extended interview about your responses to the questionnaire previously submitted.

This study has been approved by the UCL Research Ethics Committee (Project ID Number): 6028/001

Thank you for your interest in taking part in this research. Before you agree to take part, the person organising the research must explain the project to you.

If you have any questions arising from the explanation already given to you, please ask the researcher before you decide whether to join in. You will be given a copy of this Consent Form to keep and to refer to at any time.

Participant’s Statement

I

• have read the notes written above and the information sheet, and understand what the study involves.

• understand that if I decide at any time that I no longer wish to take part in this project, I can notify the researchers involved and withdraw immediately.

• consent to the processing of my personal information for the purposes of this research study.

• understand that such information will be treated as strictly confidential and handled in accordance with the provisions of the Data Protection Act 1998.

• understand that the information I will submit can be published as a report. Confidentiality and anonymity will be maintained and it will not be possible to identify me from any publications.

• agree that my non-personal research data may be used by others for future research. I am assured that the confidentiality of my personal data will be upheld through the removal of identifiers

Please tick the boxes below if you are agree with the next statements:

• I understand that my participation will be taped, recorded and I consent to use this material as part of the project.

• I agree to be contacted in the future by UCL researchers who would like to invite me to participate in follow-up studies.

• I agree that the research project named above has been explained to me to my satisfaction and I agree to take part in this study

Signed: ________________________ Date: ______________

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Appendix 2. First Questionnaire

Good morning/afternoon. We are doing some research into issues about the perception of the space and the relations with the use of technological devices and wonders if you might be kind enough to spare us 10 minutes of your time? Your answers will be treated in complete confidence and it will not be possible to identify your responses in any published materials. You are under no obligation to answer any question here, although it would be great if you felt able to complete it. Many thanks for your participation.

INSTRUCTIONS: Please fill in the following little survey—just write a brief answer where is required or check the box that comes closest to your view on each item.

Q1. Could you give a brief description of the place where you live?

Q2. About how long have you lived in the neighborhood where you live now?

Q3. What best describes where you live?

Q4. Do you use Internet, at least occasionally? If you answered no, please skip to question 5.

Q5. Do you send or receive email, at least occasionally?

Q6. Have you ever viewed or accessed anything on the internet, whether on a computer, cell phone, in video or other device?

Q7. What is your gender?

Thank you so much for your time in completing this questionnaire. We are extremely grateful.

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## Appendix 3. The Silver Surfers Checklist Course

**LEVEL 1 - IT Checklist**

<table>
<thead>
<tr>
<th>Assessment dated</th>
<th>Student Name</th>
<th>Student email</th>
<th>Tutor/Volunteer</th>
</tr>
</thead>
</table>

**Content of course**

- Turning the computer on and off
- Understanding the keyboard
- Using the mouse
- Understanding computer and internet jargon
- Accessing the Browser/Getting on the internet
- Navigating the internet (Using the address bar, back and forward buttons, home button etc)
- Using favourites/bookmarks
- Security Basics
- Using Google
- Accessing email accounts
- Sending and receiving basic emails
- Sending and receiving attachments/opening
- Sending and receiving zip files/opening
- Altering screen size, computer and internet

Overview of ICT-related skills taught in the Silver Surfer workshops in Cornish community centres (BT, 2013).
## Questionnaire Guide: Internet Usage

<table>
<thead>
<tr>
<th>Question</th>
<th>Users</th>
<th>Non-Users</th>
<th>Ex-Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q.0 Date</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Q.1 Does your household have access to the Internet?</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Q.2 Is your household planning to get access to the Internet at home in the next year</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Q.3 How long has your household had an Internet connection?</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.4a Do members of your household get access to the Internet through a telephone company</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.4b Do members of your household get access to the Internet through a cable television company</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.5 Do you have wireless access in your household such as through wi-fi?</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.6 Thinking about the speed Internet service at home are you subscribed to a basic broadband service, or do you pay for a premium service to get a faster speed?</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.7 Is your Internet connection fast enough to do what you want online or too slow to do some of the things you would like to do?</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.8a Of a number of things that some household have, and others do not, could you tell me if your household has...? Cable TV</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.8b Of a number of things that some household have, and others do not, could you tell me if your household has...? Satellite TV</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.8c Of a number of things that some household have, and others do not, could you tell me if your household has...? Digital camera(s)</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.8d Of a number of things that some household have, and others do not, could you tell me if your household has...? Webcam for a computer</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.8e Of a number of things that some household have, and others do not, could you tell me if your household has...? Portable MP3 player</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.8f Of a number of things that some household have, and others do not, could you tell me if your household has...? Hand held tablet</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.8g Of a number of things that some household have, and others do not, could you tell me if your household has...? E-book reader</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.8h Of a number of things that some household have, and others do not, could you tell me if your household has...? Game console</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.8i Of a number of things that some household have, and others do not, could you tell me if your household has...? Smart TV</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.9 Whether or not they are connected to the Internet, how many working computers are available for people to use in this household?</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.10 Do you yourself use a computer anywhere, whether or not it is connected to the Internet?</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.11 Do you yourself have a mobile phone?</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.12a Do you use your mobile phone to...? Make phone calls/talk to others</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.12b Do you use your mobile phone to...? Send or reading email</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.12c Do you use your mobile phone to...? Send text messages</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.12d Do you use your mobile phone to...? Play games</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.12e Do you use your mobile phone to...? Post a photo or video online</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.12f Do you use your mobile phone to...? Send photos</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.12g Do you use your mobile phone to...? Listen to music (Mp3)</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.12h Do you use your mobile phone to...? Find directions or locations</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.12i Do you use your mobile phone to...? Browse or update social network sites</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.12j Do you use your mobile phone for...? Use a software application or an &quot;app&quot;</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Q.12k Do you use your mobile phone for...? Browse the Internet</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>QU.1a Do you currently go online...? At home</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.1b Do you currently go online...? At other's person home</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.1c Do you currently go online...? At work</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.1d Do you currently go online...? At school or university</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.1e Do you currently go online...? At Internet Café</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.1f Do you currently go online...? At public library</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.1g Do you currently go online...? At community centre</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.1h Do you currently go online...? At other...</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.2 When go online, do you mostly use mobile phone or mostly use other device?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.3 About how long have you been going online?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.4 How would you rate your ability to use the Internet?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.5a How often do you: Check your email?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.5b How often do you: Do instant messaging?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.5c How often do you: Participate in chat rooms?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.5d How often do you: Send attachments with your email?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.5e How often do you: Make or receive phone calls over the Internet?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>--------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.5f How often do you: Read a blog?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.5g How often do you: Write a blog?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.5h How often do you: Maintain a personal website?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.5i How often do you: Post messages on discussion or message boards?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.5j How often do you: Check or update your profile on a social network site</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.6a When online, how interact with: People who share your personal interest?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.6b When online, how interact with: People with different personal interest?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.6c When online, how interact with: People who share your political views?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.6d When online, how interact with: People with different political views?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.6e When online, how interact with: People who share your job or occupation</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.6f When online, how interact with: People in different jobs or occupation</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.7 Ever found a friend/acquaintance online you haven't seen for a long time?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.8 Met on the Internet?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.9 How many people have you met on the Internet that you did not know before?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.10a When 1st met online were any of these people: Users of hobby/intrst site</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.10b When 1st met online were any of these people: Friends of friends?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.10c When 1st met online were any of these people: Complete strangers?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.11 Have you gone on to meet any of them in person?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.12a Do you use any of the following: Facebook?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.12b Do you use any of the following: LinkedIn?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.12c Do you use any of the following: Twitter?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.12d Do you use any of the following: An online dating site: eHarmony/Match?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.12e Do you use any of the following: Pinterest?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.12f Do you use any of the following: Bebo?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.12g Do you use any of the following: MySpace?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.12h Do you use any of the following: Google+?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.12i Do you use any of the following: Instagram?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.12j Do you use any of the following: Another social network site?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.13a Social network: how often: Update your status (post a Tweet/FB update)?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.13b Social network: how often: Update personal information (eg address/work)?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.13c Social network: how often: Post pictures or photos you, yourself, took?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.13d Social network: how often: Post writing/creative content you authored?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.13e Social network: how often: Comment on someone else's content: status/pix?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.13f Social network: how often: Re-post/share links/news posted by others?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.13g Social network: how often: Click on a link that takes you to a web page</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.13h Social network: how often: Check or change your privacy settings?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.13i Social network: how often: Learn about or follow a politician</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.13j Social network: how often: Join/start a group that discusses politics?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.13k Social network: how often: Receive news or information?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.13l Social network: how often: Like/follow a page sponsored by a company?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.13m Social network: how often: 'Like' / promote content that other people post?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.13n Social network: how often: Unfriend/unfollow someone from your network?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.14a When not online, how often: Exercising or participating in sports?</td>
<td>X X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.14b When not online, how often: Watch TV?</td>
<td>X X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.14c When not online, how often: Read books?</td>
<td>X X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.14d When not online, how often: Generally, go out, eg pub, cinema?</td>
<td>X X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.14e When not online, how often: Play board games or cards?</td>
<td>X X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.15a Min/week: Online at home</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.15b Min/week: Online at school</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.15c Min/week: Online at work</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.15d Min/week: Online on the move/while travel?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.16a Agreement: The Internet makes life easier</td>
<td>X X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.16b Agreement: The Internet is frustrating to work with</td>
<td>X X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.16c Agreement: There is too much immoral material online</td>
<td>X X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.16d Agreement: Going online is an efficient means for finding information</td>
<td>X X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.16e Agreement: I feel/felt/can be addicted to the Internet [diff non&amp;ex]</td>
<td>X X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.16f Agreement: I find/found dealing with the amnt of info online exhausting</td>
<td>X X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.16g Agreement: I waste/wasted time on irrelevant info to get to what I look for</td>
<td>X X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.17a Agreement: Going online allows me/people to keep in touch with people [non&amp;ex]</td>
<td>X X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.17b Agreement: It is easier for me/ppl to meet people online than in person</td>
<td>X X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.17c Agreement: The Internet helps me/ppl save time</td>
<td>X X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Statement</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>----------</td>
<td>-----------</td>
<td>-----</td>
<td>----</td>
</tr>
<tr>
<td>QU.17d</td>
<td>Agreement: People can/could find personal information about me online</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QU.17e</td>
<td>Agreement: It is difficult to delete personal information once it is online</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QU.17f</td>
<td>Agreement: I/[most people] waste/wasted too much time online</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QU.17g</td>
<td>Agreement: Going online helps/ed me/ppl pass the time when I am bored[diff non]</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QU.17h</td>
<td>Agreement: When I’m/was/[people] online I/[they] don’t feel lonely</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QU.17i</td>
<td>Agreement: Dealing with email takes up too much time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.17j</td>
<td>Agreement: I just enjoy/ed being online to see what comes up [diff ex]</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QU.17k</td>
<td>Agreement: Going online helps/ed me escape from things [diff ex]</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QU.18a</td>
<td>Contact family/friend nearby: Going to visit them or they come here?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QU.18b</td>
<td>Contact family/friend nearby: Calling them on the phone?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QU.18c</td>
<td>Contact family/friend nearby: Emailing or instant messaging them?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QU.18d</td>
<td>Contact family/friend nearby: Writing a card or a letter to them?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QU.18e</td>
<td>Contact family/friend nearby: Text messaging?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QU.19a</td>
<td>Contact family/friend faraway: Going to visit them or they come here?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QU.19b</td>
<td>Contact family/friend faraway: Calling them on the phone?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QU.19c</td>
<td>Contact family/friend faraway: Emailing or instant messaging them?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QU.19d</td>
<td>Contact family/friend faraway: Writing a card or a letter to them?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QU.19e</td>
<td>Contact family/friend faraway: Text messaging?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QU.20</td>
<td>Which describes your current situatn? (labour force status-lifestage scale)</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QU.21</td>
<td>How often do you use the Internet at home for work related activities?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QU.22</td>
<td>Do you use the Internet while you are at work?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.23a</td>
<td>Have you ever used the Internet to: Learn new work-related skills?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QU.23b</td>
<td>Have you ever used the Internet to: Advertise yourself or your services?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QU.23c</td>
<td>Have you ever used the Internet to: Collaborate on common projects?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QU.23d</td>
<td>Have you ever used Internet to: Meet new colleagues in other workplaces?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QU.24a</td>
<td>Do you use Internet: Read/send work email or other electronic messages?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QU.24b</td>
<td>Do you use Internet: Watch work-related videos?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Response</td>
<td></td>
<td></td>
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<tr>
<td>----------</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>QU.24c Do you use Internet: Participate in meetings over the Internet?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.24d Do you use Internet: Read items or info on your organization's Intranet?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.24e Do you use Internet: Post on your organization's Intranet?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU.24f Do you use Internet: Update your Facebook page or Tweet while at work?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QN.1a Reasons don't use the Internet: I am just not interested</td>
<td>X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QN.1b Reasons don't use the Internet: I have no connection available</td>
<td>X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QN.1c Reasons don't use the Internet: I have no computer available</td>
<td>X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QN.1d Reasons don't use the Internet: It's too difficult to use</td>
<td>X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QN.1e Reasons don't use the Internet: It's not useful</td>
<td>X X</td>
<td></td>
<td></td>
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<tr>
<td>QN.1f Reasons don't use the Internet: It's too expensive</td>
<td>X X</td>
<td></td>
<td></td>
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<tr>
<td>QN.1g Reasons don't use the Internet: I am worried about my privacy</td>
<td>X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QN.1h Reasons don't use the Internet: Worry about bad experience w/ SPAM/viruses</td>
<td>X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QN.1i Reasons don't use the Internet: I do not have enough time</td>
<td>X X</td>
<td></td>
<td></td>
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<tr>
<td>QN.1j Reasons don't use the Internet: There's nothing of interest on Internet</td>
<td>X X</td>
<td></td>
<td></td>
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<tr>
<td>QN.1k Reasons don't use the Internet: Do not yet know how to use the Internet</td>
<td>X X</td>
<td></td>
<td></td>
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<tr>
<td>QN.1l Reasons don't use the Internet: It is too time consuming</td>
<td>X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QN.1m Reasons don't use the Internet: It's not for people of my age</td>
<td>X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QN.1n Reasons don't use the Internet: It's not for people like me</td>
<td>X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QN.2a Agreement: I miss out by not using the Internet and Email</td>
<td>X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QN.2b Agreement: I sometimes feel left out when my friends talk about Internet</td>
<td>X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QN.2c Agreement: I am better off not using the Internet</td>
<td>X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QN.2d Agreement: I would like to use the Internet in the future</td>
<td>X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QN.2e Agreement: I could perform better in my daily tasks if I used the Internet</td>
<td>X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QN.3 Do you know someone who could send email or use the Internet for you?</td>
<td>X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QN4.a Who could you ask for help on Internet related matters: Parent?</td>
<td>X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QN4.b Who could you ask for help on Internet related matters: Friend?</td>
<td>X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QN4.c Who could you ask for help on Internet related matters: Partner/Spouse?</td>
<td>X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QN4.d</td>
<td>Who could you ask for help on Internet related matters: Child/Grandchild?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QN4.e</td>
<td>Who could you ask for help on Internet related matters: Brother/Sister?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QN4.f</td>
<td>Who could you ask for help on Internet related: Internet café staff?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QN4.g</td>
<td>Who could you ask for help on Internet related matters: Library staff?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QN4.h</td>
<td>Who could you ask for help on Internet related matters: Community Centre staff?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QN4.i</td>
<td>Who could you ask for help on Internet related matters: A colleague?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QN.5</td>
<td>Have you asked someone to send email/get info/purchas pdt for you:proxy use</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QN.6a</td>
<td>Who asked for help: Parent?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QN.6b</td>
<td>Who asked for help: Friend?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QN.6c</td>
<td>Who asked for help: Partner/Spouse?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QN.6d</td>
<td>Who asked for help: Child/Grandchild?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QN.6e</td>
<td>Who asked for help: Brother/Sister?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QN.6f</td>
<td>Who asked for help: Internet café staff?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QN.6g</td>
<td>Who asked for help: Library staff?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QN.6h</td>
<td>Who asked for help: Community Centre staff?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QN.6i</td>
<td>Who asked for help: A colleague?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QN.7</td>
<td>Are you planning to get access to the Internet in the next year or so?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QN.14</td>
<td>Ever had difficulty find/apply for a job bcs don't use the Internet?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QE.1</td>
<td>For how long did you use the Internet? 23 ctg</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QE.2</td>
<td>How long ago was it that you stopped using the Internet? 23 ctg</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QE.3a</td>
<td>Reasons for going online: To try out, thought it might be interesting</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QE.3b</td>
<td>Reasons for going online: I had to use it for work</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QE.3c</td>
<td>Reasons for going online: I had to use it for school</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QE.3d</td>
<td>Reasons for going online: Someone else recommended it to me</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QE.3e</td>
<td>Reasons for going online: I used to have access at home/work/school</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QE.3f</td>
<td>Reasons going online: Help my children with their homework</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QE.3g</td>
<td>Reasons going online: I wanted to keep in touch with family/friends</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QE.3h</td>
<td>Reasons going online: Get a better deal by buying products/services</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QE.3i</td>
<td>Reasons going online: Other</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QE.5a</td>
<td>Did you use the Internet for: Checking emails?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QE.5b</td>
<td>Did you use the Internet for: Finding or checking a fact?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>QE.5c</td>
<td>Did you use the Internet for: Downloading music?</td>
<td>X</td>
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</tr>
</tbody>
</table>

323
<p>| QE.5d Did you use the Internet for: Signing a petition online? | X |
| QE.5e Did you use the Internet for: Getting info about local council services? | X |
| QE.5f Did you use the Internet for: Getting info school/college/university pjts? | X |
| QE.5g Did you use the Internet for: Posting messages on discussion/msg boards? | X |
| QE.5h Did you use the Internet for: Getting information about local events? | X |
| QE.5i Did you use the Internet for: Using your bank's online services? | X |
| QE.5j Did you use the Internet for: Getting info about or comparing products? | X |
| QE.5k Did you use the Internet for: Making or receive phone calls (skype)? | X |
| QE.5l Did you use the Internet for: Making travel plans? | X |
| QE.5m Did you use the Internet for: Getting jokes, cartoons or humorous content? | X |
| QE.5n Did you use the Internet for: Paying your bills online? | X |
| QE.5o Did you use the Internet for: Playing games online? | X |
| QE.5p Did you use the Internet for: Listening to music online? | X |
| QE.5q Did you use the Internet for: Watching movies or films online? | X |
| QE.5r Did you use the Internet for: Watching TV programs online? | X |
| QE.5s Did you use the Internet for: Check or update a social network site | X |
| QE.5t Did you use the Internet for: Post writing, stories, poetry, creative work | X |
| QE.5u Did you use the Internet for: Post photos that you, yourself, took? | X |
| QE.5v Did you use the Internet for: Re-post/share photos someone else took? | X |
| QE.5w Did you use the Internet for: Looking for the latest celebrity news? | X |
| QE.6a Did you: Receive obscene or abusive e-mails | X |
| QE.6b Did you: Receive a virus onto your computer | X |
| QE.6c Did you: Buy something which had been misrepresented on a Web site | X |
| QE.6d Did you: Have credit card details stolen via use on the Internet | X |
| QE.6e Did you: Get contacted by someone online asking you to provide bank detail | X |
| QE.6f Did you: Accidentally arrived at a pornographic website | X |
| Q.13 Age | X | X | X |
| Q.14 Gender | X | X | X |</p>
<table>
<thead>
<tr>
<th>Question</th>
<th>X</th>
<th>X</th>
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<tbody>
<tr>
<td>Q.15 How many adults live in your household (people over the age of 18)?</td>
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<tr>
<td>Q.16 Excluding you, how many other members of your hh use the Internet?</td>
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<tr>
<td>Q.17 Postcode, 8 characters</td>
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<td>Age Range</td>
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<td>Internet Usage</td>
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<tr>
<td>Lifestage</td>
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