Designing Sustainable Interfaces Between Communities and Organisations

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Abstract

This thesis explores the role of systems and processes to support inter-community communication and relations between communities and public service institutions. I explore two contexts, rural and urban, and the potential of technical systems to support communities organise, but also support better understanding and dialogues between services providers and beneficiaries. This potential depends on the contextual barriers and opportunities and the willingness of stakeholders to adopt systems and processes that inevitably effects change in day-to-day organisational cultures. Drawing from two longitudinal case studies in the North-East of England, I describe the requirements of these systems to be used effectively and sustainably by communities and public service institutions. The first case study developed with rural communities of Wooler and Rothbury where, over the course of three years, a community-run pervasive display network was designed and deployed to bolster intra-community communication. I describe the development of a partnership with Glendale Gateway Trust and the design and deployment of simple hardware and bespoke software packaged alongside a suggested approach for its administration and governance. The study explores the implications of incorporating a governance model with particular focus on how this impacts ownership, moderation and maintenance as part of sustaining technical systems between self-organised configurations of communities. The second case study, developed with Northumbria Police's Neighbourhood Policing team, involved the iterative design, implementation and evaluation of an approach to support police officers communicate more effectively with local communities and better understand local issues. The intervention aimed to strengthen community-institutional relations; it included training neighbourhood police officers in alternative modes of community engagement and ways to configure technical processes for public institutions' specific needs and challenges. Learning from these two case studies is synthesized in a discussion of the different ways technical systems and processes can be designed and

configured to meet stakeholders' needs and organisational cultures; and to embody important values such as sustainability, scalability, moderation, governance and ownership.

Publications

Nicholson, S., Crivellaro, C., Clear, A., Jackson, D., Comber, R., Vlachokyriakos, V and Olivier, P., 2021, May. Sustaining a Networked Community Resource: Findings from a Longitudinal Situated Display Deployment. In Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems (pp. 1-19).

Nicholson, S., Jackson, D., Clear, A. and Olivier, P., 2019, June. Showboater: insight into sustainable rural community display networks from a longitudinal study. In *Proceedings of the 8th ACM International Symposium on Pervasive Displays* (pp. 1-7).

Zhai, B., Nicholson, S., Montague, K., Guan, Y., Olivier, P. and Ellis, J., 2019. Co-sleep: Designing a workplace-based wellness program for sleep deprivation. In *13th EAI International Conference on Pervasive Computing Technologies for Healthcare-Demos and Posters*. European Alliance for Innovation (EAI).

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1) Introduction

1.1) Community interfaces

When we think of technology in its broader sense, the term 'interface' is typically associated with a software based 'user interface' as the means by which a person can interact with a computer system. Historically the second wave of Human Computer Interaction (HCI) demonstrated a rich timeline of exploration into the characteristics of interfaces through examining how the human mind processes information displayed on computers, and how people respond through these user interfaces (Duarte and Baranauskas, 2016). In the past decade, the UK has been slowly managing the effects of austerity whereby government funding was cut to help address the national deficit. Budgets for government provided services, public institutions, and funds previously available for non-profit organisations were severely reduced which placed a far greater emphasis on technology as it was launched to the forefront of service delivery as a more cost effective interface between service providers and communities (Olivier and Wright, 2015). In the same timeframe, the Localism Act of 2011[1] was introduced as an example of legislation and policy which set out to decentralise and democratise local government in more participative ways which distilled service provision more sensitively to a local context which in turn, allowed people to have more say about what is important in their lives.

The circumstances at this time drove research into new participative models of service provision, which is strongly underpinned by the use of digital technology. It is at this point where the work undertaken as part of this PhD thesis seeks to examine the how digital technology can sustainably serve as an interface between different communities, public institutions and non-profit organisations, in a time where communities are still facing real

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[1] https://www.legislation.gov.uk/ukpga/2011/20/contents/enacted

problems as a result of austerity measures. Examples of work situated in this space has examined how technology and the processes that run alongside them, can be created to better support communities, organisations and groups of people, including schools and schoolchildren (Dodds *et al.*, 2017; Richardson *et al.*, 2018), workers and workplaces (Abdulgalimov *et al.*, 2020), refugees (Talhouk *et al.*, 2016), volunteer youth (Lambton-Howard *et al.*, 2019; Rainey *et al.*, 2020), and citizens in general (Crivellaro, Taylor, Vasillis Vlachokyriakos, *et al.*, 2016; Vlachokyriakos *et al.*, 2018).

1.2) Context and aims

In particular, my research, focuses on supporting interfaces between communities, public institutions and Non-Profit Organisations (NGO's) who, in recent years, have all found themselves challenged by constraints of austerity measures implemented in the United Kingdom. I use the term community in its wider sense, as a way of describing groups of people in neighbourhoods, civic groups and public associations (Carroll, 2001) who are typically co-located in the same geographic area. Additionally, the 'sense of community' or 'perception of community' can be more concretely defined by McMillan and Chavis (1986) and characterised by four individual characteristics; 'Membership', as the feeling of 'belonging or sharing a sense of personal relatedness'; 'Influence', as the shared sense of making a difference to a group; 'Integration' as the feeling of individual members needs being met by the resources received through membership to the group and 'shared emotional connection', as the shared history, place, time and experience each group member shares. In HCI literature, examples of this perceived understanding of community an be seen in Wray (Taylor and Cheverst, 2010a), South East London (Crivellaro, Taylor, Vasilis Vlachokyriakos, *et al.*, 2016) or the North East (Vlachokyriakos *et al.*, 2014). Through two case studies, my approach has been to engage in process of Action Research that designs and configures technology to respond to the unique requirements of people in constrained communities. The system implementations presented in

my two case studies explored existing roles, social structures and intra-community relations of their respective deployment domains; with each solution implementing mechanisms which support aspects of governance, adoption and sustainability.

The place-based nature of my research is significant, given the effects of austerity in the United Kingdom, and the disproportionate impact this have had on local service provision in Northumberland, Newcastle-Upon-Tyne[2], Gateshead and Sunderland. The newly assigned budgets from central government for these areas resulted in local councils having to outright disband or severely reduce their services. Services such as waste management, transport, pre-university education and social care were particularly affected with the more rural parts of the North East (situated outside of urban cities such as Newcastle-upon-Tyne and Sunderland) suffering more severely from service reductions. In particular, these areas struggled with reduced service provision in rural transport coupled with the decrease in educational services which had severe implications for young people. Evidently, local councils regardless of location now have fewer resources and capacity to deliver public services. However, particularly in the North East, there are significant differences in the allocation of resources faced by local government and communities alike in urban and rural areas respectively.

With public services now struggling to meet the demand of their service users, alternative forms of service provision are starting to emerge at the civic level. Digital Civics aims to re-configure the services provided by local authorities to strengthen the relationships between citizens and local service providers (Olivier and Wright, 2015). The approach aims to afford citizens more involvement and agency in the local government processes (i.e. the design, delivery and governance of local services) than has previously been possible. My research comprises of two distinct case studies conducted in the North East of England in the urban areas of Newcastle-Upon-Tyne and Gateshead, as well as the rurally centralised town of

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[2] https://tinyurl.com/ydgjpetd

Wooler, Northumberland. Over a four-year period, these two pieces of longitudinal fieldwork and the subsequent deployments aim to better connect communities. The first study examines the design of two distinct community display networks, each consisting of eight or more displays, deployed in the rural towns of Wooler and Rothbury respectively. The display networks purpose in both cases was to communicate general information more efficiently amongst visitors and local residents. The second case study consisted of working in collaboration with Northumbria Police in central Gateshead and Sunderland to stage an intervention in order to design an online training package for neighbourhood police officers. The purpose of the package is to introduce officers to a new form of community engagement in order to more effectively connect with citizens. I reflect on the design, deployment and longitudinal appropriation of these systems as a way of instantiating digital infrastructure in two separate resource-constrained communities.

1.3) Designing for sustainable community technologies

There has been much research conducted into community technologies which predominantly focuses on their technical implementations. However, more recently studies have begun to examine the implications on people when deploying community technology with view of how it can be implemented longer-term. Taylor *et al.* (2013) examined the implications of handing over technology to communities at the point at which research studies stopped. His work highlights the need to specifically plan and prepare for community handover, by setting appropriate expectations, leveraging the skills of proactive members of the community (or 'champions') and identifying resources which can help soothe the transition of communities adopting technology. Whilst these recommendations are suitable for small-scale community technology, they fail to consider the implications when technology is scaled and how it can be sustained, past the point of handover when the resources, skills and expertise afforded by researchers is taken away. It would be reasonable to assume that when community technology

is scaled and the work and effort of singular champions or proactive community members is not enough, that different roles or spared responsibility would begin to emerge, as Peltonen *et al.* (2008) demonstrated in their study. Research conducted by Jones *et al.* (2008) highlights the questions which can emerge from participants (communities) about the distribution of work and how role, maintenance and moderation can be supported when community technology is handed over. Prior work conducted in anticipation of this PhD study (as part of an MRes 2015-2016) examined the implications of sustaining a rural display network, as an example of deployed community technology. The display network was originally instantiated by a Big Lottery funding scheme[3] just a year earlier and given that funding had since ceased, there was a necessity to understand its longer-term sustainability, management, day-to-day running and administration. This changing time for the display network provided the opportunity to witness first-hand the concerns and questions raised by Jones *et al.* (2008), Peltonen *et al.* (2008) and Taylor *et al.* (2013), and provided an ample opportunity to address the emerging issues of ownership, management and administration of community technology.

Technology in itself is just an artifact, however the aforementioned studies have begun to explore beyond the boundaries of what technology is as an entity, straying into the implications for what technology is for real people, with a view to being able to sustainably adopt technology. This re-framing of technology emphasises the social aspects of technology (socio-technical) by taking greater account of the invisible work which takes place in the background when community technology is deployed (Star, 1999). Studies to date have not placed enough emphasis on the social configurations that are needed to support technology when it is deployed '*in the wild*'. Attention needs to be drawn to how communities adopt technology, how aspects of governance unfold and why technology needs to be sensitive to these aspects to be properly configured for sustainability. Taylor *et al.* (2013) noted "in terms

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[3] 3 https://www.tnlcommunityfund.org.uk/

of research outputs, this [handover] phase of the project is one of the least important, but where sustainable benefit for the community is desired, it is vital". Arguably, the handover phase is equally as important to consider and publicise as it will serve to inform future research for how technology should be more adequately designed for sustainable use. At this crucial point in the timeline of events, the presence of the public display network allowed me to unearth, in granular detail, the invisible work (Star, 1999) needed to sustain community technology by exploring questions pertaining technology adoption, governance and sustainability.

1.3.1) Research question 1: adoption and sustainability

Question 1: What are the challenges and opportunities associated with adoption in sustainable community technologies?

Adoption encompasses the mechanisms by which technology stops being an artifact of a research study and when it begins to form a meaningful relationship with a community. Adoption is concerned with the ways in which technology allows people to build a sense of ownership and trust with it, as well as how that technology is perceived (Marsden, Maunder and Parker, 2008). This question seeks to better understand the challenges and opportunities that present themselves when designing technology, so that we can learn how to better align community interfacing initiatives to common practice and working cultures, to mitigate the burden commonly associated with prolonged use. With this strive to weave technology into the existing routines of society, this question also seeks to explore how the effort, skill and expertise of individual 'champions' can be distributed to share the load when technology scales, as well as identifying the resources required (Memarovic *et al.*, 2013) for longitudinal deployment when the researcher steps away (Taylor *et al.*, 2013). Sustainable adoption is also reinforced by the way in which the researcher initially approaches the study by how they instil trust and expectations.

1.3.2) Research question 2: governance and sustainability

Question 2: What are the challenges and opportunities associated with governance in sustainable community technologies?

Governance is comprised of all the mechanisms and processes which are used to control and organise the operation and distribution of effort and workload, in the context of community technology (Jones *et al.*, 2008). This question seeks to explore the challenges and opportunities which present themselves when aspects of governance emerge through long-term deployments of technology, as to provide recommendation for the design of sustainably governable community interfacing technology. These models and frameworks will be sensitive to the often-overlooked workload which invisibly exists when trying to manage community technology (Neumann and Star, 1996). This question also seeks to understand the needs of communities in respect of carrying out governance and how their needs can be sustained without the necessity for researcher involvement (Taylor *et al.*, 2013).

1.4) Research approach

The approach most appropriate for the work due to be undertaken as part of this thesis is action research. Action research is an iterative inquiry process which has been widely adapted and applied in a diverse range of disciplines but has more recently surfaced in the field of HCI (Hayes, 2011). This approach affords me the opportunity to work alongside individual stakeholders and domain experts who reside in the communities, allowing me a far greater depth of integration than other approaches may allow. Action research allows me to embrace the role of the "friendly outsider"; a researcher who can integrate with the community stakeholders to learn, understand and pragmatically conduct research activities whilst being increasingly aware of the implications that research and what impact it has on the wider community. This approach also serves to develop meaningful and productive relationships with stakeholders by demonstrating commitment, overcoming personal and institutional barriers to

community-based design research (Le Dantec and Fox, 2015). Action research is closely linked with the approach set out by Digital Civics literature which adopts a human-centered and participatory approach to connect with citizens, providing a rich understanding of the challenges whilst returning systems and services that are meaningful and helpful (Olivier and Wright, 2015). Given the emphasis on exploring aspects of sustainability as the main questions driving this research, the approach is most applicable as the ultimate goal of action research is concerned with creating sustainable change by conducting projects where communities can eventually take full control of novel technologies, policy changes and newly developed processes (Hayes, 2011).

1.5) Thesis overview

The remaining chapters of the thesis are structured in the following way. Chapter 2) explores the theoretical background for this work and existing relevant research and case studies. This includes an introduction to relevant changes which have taken place in the past decade highlighting the shift in focus that HCI has witnessed. The chapter provides an overview of related background literature surrounding the framing concepts of 'infrastructuring', 'things' and 'publics'.

Chapter 3) explains the background context of rural communities in Northumberland and the application of two action research cycles in this specific context. This chapter provides an overview of the two action research cycles which took place in Northumberland with specific insight into the methods employed for both research and for software development, related literature of public displays, data gathering and evaluation and reflection as well as an introduction to relevant stakeholders and actors.

Chapter 4) provides a summative overview of work already completed in rural Northumberland prior to the work of this PhD thesis beginning. The early research serves as critical background and context for the framing of work outlined as part of the subsequent

action research cycles. Following this, the chapter outlines the planning, design, implementation and deployment of Showboater, as a new software player for networked community displays. Showboater was deployed in a total of two rural towns.

Chapter 5) finalises case study one with a comprehensive insight into my own experiences of deploying Showboater, as a piece of community technology, as well as the findings which emerged from looking back across the timeline of both rural deployments. This chapter culminates approximately four years of research into rural communities and their use of the display networks with specific insights into aspects of maintenance, administration, moderation and community tensions.

Chapter 6) introduces the second and final case study which takes place in the urban areas of Newcastle Upon Tyne, Gateshead and Sunderland. This chapter explains the background context of urban communities in the North East and methods of engagement employed by Police, and the application of two action research cycles in this context. This chapter provides an overview of the two action research cycles which took place in North East urban communities with specific insight into the methods employed for data gathering, evaluation and reflection as well as an introduction to relevant stakeholders and actors.

Chapter 7) examines the first cycle of action research as part of case study two. This includes an overview of the planning, design, deployment and reflection which took place surrounding the creation of a world café training programme. The training programme itself was a way for police stakeholders to implement a more meaningful way of reaching out to communities. The chapter details the deployment of the training programme, the first two community engagement events which took place as well as reflections on both.

Chapter 8) builds on the work completed in the previous chapter, by carrying out an additional cycle of action research. In this chapter, I detail the how the training programme was re-designed so that it implements a crowdfunding element as an attempt to add resources to

Northumbria Police's community engagement initiative. Police then ran a further five community engagement events which took place across the North East in a variety of locations. I reflect on the outcomes of the world café's and the shortcomings of the crowdfunding bolt-on, as well as broader findings which emerged throughout the case study which span approximately two years.

Chapter 9) concludes the main findings which emerged from the research presented in this thesis. The conclusion answers the research questions set out in respect of examining aspects of governance and adoption and their implications on the sustainability of community technology. Furthermore, the conclusion also provides a possible direction for what future work into community technology should take account of.

2) Literature Review

2.1) Shift in HCI

In the past 20 years, Human Computer Interaction (HCI) has started to refocus its objectives by steering away from examining the application of technology in uncommon or edge-case scenarios and situations to designing and deploying technology interventions into community settings (Le Dantec, 2012). For example, even in the year 2020, it is an ongoing battle for governments and organisations across the world who are still attempting to eliminate issues of poverty and provide better opportunities for education and empowerment (Marsden, 2006; Tayoma, 2010; Salim and Wangusi, 2014; Eksteen *et al.*, 2019), particularly in low- and middle-income countries (LMICs) (Patel *et al.*, 2010; Smyth *et al.*, 2010). In the past decade however, researchers in HCI have broadened their scope to also include western settings, with studies examining the implications of technology on, and proposing innovative digital services for, marginalised groups and societies of Europe and America (Roberson and Nardi, 2010; Taylor and Cheverst, 2010a).

The projects previously cited have opened new insights into working with groups of at-risk members of society, or engaging with small and isolated communities (Le Dantec, 2012). Similarly, as time has progressed, there has been an increased tendency to include a greater diversity actors and stakeholders, adopt multi-party and multi-agency approaches to problem solving and overcoming shared issues. Each project in itself therefore serves as an example of HCI research which has progressively adopted values and a tailored approach which has been influenced by a set of core concepts that serve as a backbone for HCI; Deway's notion of Publics (Gripsrud *et al.*, 2010) and Star and Bowker's notion of Infrastructuring (Star, 1999).

Deway's concept of publics underpins the approaches taken in HCI for the design of interactive technology by providing a space for the conceptualising multi-party engagement

with technology by identifying and relating shared issues and promoting or supporting different forms of action taken to mitigate or contend with those issues (DiSalvo, Maki and Martin, 2007; DiSalvo, 2009). As the public assemble to tackle issues, it implicates a set of relations in the world, both via individuals and via resources in the community (Le Dantec, 2012) which Marres describes as 'attachments' (Marres, 2007), a concept derived from Gomart and Hennion denoting the relationship between human and non-human entities which is characterised by 'active commitment' and 'dependency' (Gomart and Hennion, 1999). "The notion of attachments foregrounds the dynamic relationships between issues and diverse stakeholders and helps mitigate a tendency towards assuming a stable set of values, or ideas, or institutional relationships" (Le Dantec, 2012; Le Dantec and DiSalvo, 2013). This suggests that people engage with issues because of their ontological association with them (Marres, 2007) and connects to the ongoing discourse about the role of PD as a means for engaging with marginalization (Le Dantec and DiSalvo, 2013). As part of the work completed in this thesis, I focus on the latter concept of infrastructuring "publics" as the guiding conceptual framework for my own work of developing and integrating different forms of social and technical infrastructure in a sustained process of developing and refining 'attachments' for different social and technical resources (Le Dantec, 2012).

2.2) Infrastructure to 'Infrastructuring'

The term infrastructure means different things to different groups. It can be a common term typically used to describe the basic organisational and physical structures and facilities that are required for a society or enterprise to operate (Star, 1999). Infrastructure, in this most basic sense, is exemplified by buildings, roads, pipes, wires and communication networks. In a more abstract sense, infrastructure can be seen to take the form of protocols, standards and memory whilst the addition of 'information' gestures towards digital facilities and services associated with the internet (Bowker *et al.*, 2010). The concept of *information infrastructure* extends this

meaning to also include other actors; designers, developers, users, mediators, managers and administrators as emerging roles that are present in modern day society. Information infrastructure requires us to think about how infrastructure might take into account the social and organizational dimensions, 'allowing people who are unrelated to their formation and operation to create new content and applications without additional assistance from the system's original designers' (Karasti, 2014). In the Participatory Design (PD) community, Neumann and Star further extend our understanding of information infrastructure with the addition of a socio-technical element (Neumann and Star, 1996) which, in PD literature, is included under the term of Informatics (Carroll and Rosson, 2007). Neumann and Star's new addition placed emphasis on the socio-technical relations, which is the relationship that emerges between humans logical and organised way of carrying out tasks, with emphasis on 'doing' things, and the technologies that enable and support these actions. By focusing on these relationships and "going backstage" (Star, 1999), Star shifted the focus from "substrate to substance" to bring light to the inviable background work, coordination and action required when carrying out 'things' (Star, 1999). At the time, this extended conceptualisation of infrastructure challenged the traditional understanding which viewed technology simply as an artefact, and demanded that it instead be considered as a contextualised, "sustained relation" which is the culmination of embeddedness, transparency, reach or scope, learned as part of membership, linked with conventions or practice, embodiment of standards, built on an installed base, and becomes visible upon breakdown (Star and Ruhleder, 1994; Neumann and Star, 1996; Star, 1999).

From this point, the notion of information infrastructure has been slowly adapted and developed so that it can fit into a number of different contexts which sit under the umbrella of PD approaches, now sitting under the newly coined term of "infrastructuring". These approaches include such developments as artful, workplace and community infrastructuring

(Karasti, 2014). Artful infrastructuring refers to a hybrid of systems which comprise aspects of media, material and practices. Design, in this context, is the 'process of inscribing knowledge and activities in new material forms' (Karasti, 2014). From this perspective, change is a feature of everyday practice and new forms of technology emerge from the juxtapositions and connections present in existing forms. Designers appropriate technology to incorporate it into the existing material environment and sets of practices (Karasti and Syrjänen, 2004). Infrastructuring in the workplace saw information infrastructuring adapted to focus on the infrastructural nature of organisational IT systems; shifting the focus away from designers and design processes to "how technologies undergoing design, and the design process itself, are embedded in an existing work environment" (Pipek and Wulf, 2009). More recently, the concept of infrastructuring has also been applied to a subfield of PD which centres on communities in the form of "things' (Ehn, 2008), and more relevant to this thesis, the notion of "publics" (Le Dantec and DiSalvo, 2013).

2.3) Infrastructuring and "Things"

Largely based on a perspective gained from adapting an action research approach to working with marginalized social movements, Ehn brought to light the notion of participation in designing "things" and the strategies employed when infrastructuring them. But what exactly is a "thing"? Ehn describes a thing as the entire output of a design project, which also includes the device itself. For example, the process of drawing, modelling, cutting and welding each individual part associated with an automobile will result in a functional vehicle; this is the device. However, as Ehn explains, when you consider the social perspective of the vehicle when it is placed 'into the wild', the outcome of the design process becomes a "thing modifying the space of interaction for its users, ready for unexpected use, rich in aesthetic and cultural values, opening up for new ways of thinking and behaving" (Ehn, 2008). The notion of a "thing" is a step beyond traditional participatory design thinking which has traditionally sought

to develop systems with multi-stakeholder participation as part of the design process, but the outputs of these design processes rarely addressed future use.

2.4) Infrastructuring and "Publics"

Infrastructuring "publics" is the application of PD at larger scale; deriving core democratic values from community informatics (Carroll and Rosson, 2007). The term publics was originally defined by Deway in reference to a particular configuration of individuals who are bound by a common cause in confronting a shared issue (Deway, 1927; Karasti, Baker and Halkola, 2006). Publics acknowledges the number of individual voices and positions to provide an issue-orientated approach to community-based work. It also provides "PD with a pragmatic perspective for engaging community settings where participants and authority dynamics form complex and fluid social alignments" (Le Dantec and DiSalvo, 2013). As extension to Ehn's notion of infrastructuring things, where the idea was primarily focused around a fixed product or design-for-use which centered on useful systems, publics adopts a more longitudinal design for future use (Karasti, 2014). The shifting focus facilitates the necessity to view designed systems as ongoing infrastructure and socio-technical processes; the culmination of technology devices and the actors and participants that interact directly or indirectly with them. Infrastructuring in this context, is the "work of creating socio-technical resources that intentionally enable adoption and appropriation beyond the initial scope of the design" (Karasti, 2014). The scale of infrastructuring publics can be applied at different scales, for example it can take place in a community setting or on a societal scale.

The notion of publics is one step beyond the design of technical systems that allow multi-stakeholder responses to known issues, understood as the Marres theory of "frames". Frames is a concept which describes how the general public concern themselves about issues and is characterised by relatively stable entities including established ideas, values, symbols or institutional devices (Marres, 2007). This concept examines existing issues from a priori point

of view and by nature "do not expose the tensions present in the dependencies and commitments of a public, because those dependencies and commitments are not a priori points of view. Rather, they are marshalled and modified by the constitution of the public" (Le Dantec and DiSalvo, 2013). "Attachments" however, builds on the theory of frames and provide a means of understanding conflict inherent in the constitution of publics. Unlike frames, attachments recognise the interplay and emergence of dependencies and commitments that form as a public forms; "by approaching issues as particular entanglements of actors' attachments, it becomes possible to credit these entanglements as sources and resources for enacting of public involvement in controversy" (Marres, 2007; Le Dantec and DiSalvo, 2013). The notion of attachments therefore brings to light the relationships formed around issues and connects to the ongoing discourse about the role of PD as a means for engaging with power structures and marginalization (Le Dantec and DiSalvo, 2013). "The notion of attachments and publics enables us to move beyond a response to known relations in existing authorative structures, toward a means of understanding and expressing those same authority structures as dynamic" (Le Dantec and DiSalvo, 2013).

This vison of infrastructuring publics requires us to unfold and understand the political, ethical and social choices that have been made throughout the process so that we can examine how each individual aspect interlinks (Star, 1999; Goffman, 2016). Infrastructuring, as part of this thesis, is a shift towards creating a *sustainable* process (lifecycle) of developing technology which is sensitive to people's attachments (the relationship between stakeholders and resources) and the complex social dynamics that exist in the space in between; moving away from focusing simply on co-creating a temporally and materially fixed artefact (Le Dantec, 2012). Recent work has highlighted this shifting focus from current use to incorporate embedded sustainability and future use in design (Björgvinsson, Ehn and Hillgren, 2010;

Crosby, 2012; Prost *et al.*, 2019; Trischler, Dietrich and Rundle-Thiele, 2019; Dreessen and Schepers, 2020).

Working with communities to design and implement sustainable solutions to problems is a very intensive task for any researcher. In order to fully understand how technology can be implemented to ensure future use, researchers must build productive relationships with relevant stakeholders from within the community, often becoming 'native' to the community (Harper, 2000). Le Dantec and Fox notes how researchers are required to demonstrate commitment, overcome personal and institutional barriers and develop working relationships to shape and guide community-based research (Le Dantec and Fox, 2015) whilst engaging in "initiation rituals" where necessary to become a member of the community (Harper, 2000). The realities of carrying out community-based research and the activities researchers must engage with, as described by Le Dantec hold close parallels with the embedded values outlined in action research (as described in Chapter 3); a working methodology orientated specifically to embedding community researchers which also actively promotes sustainable social change (Hayes, 2011). However, regardless of the activities that researchers may undertake as part of the process of becoming integrated with a community, the core purpose of such activities serve to build trust between the researcher and stakeholders (Harding *et al.*, 2015; Le Dantec and Fox, 2015; Corbett and Le Dantec, 2018a). More recently, HCI research has broadened to examine how trust can be built within communities, focusing specifically on citizens and their relationships with each other and their relationships to societal infrastructure such as public services (see chapter 6).

2.5) Chapter summary

The research presented in this thesis builds on the growing body of work by examining questions about sustainable design for community technology. Besides the work of few, such as Taylor *et al.* (2013), many studies have not been able to engage in truly longitudinal

deployments which have limited their insights into the considerations for designing for sustainability at scale. This work is motivated by the need to explore the '*background work*' (Star, 1999) which invisibly takes place as part of deploying and sustaining technology in the environment. There needs to be an understanding built of how technology can be truly embedded into communities so that it purposefully adds value to the area it is installed (Hosio *et al.*, 2014), instead of being viewed as a temporary technological artifact which is perceived to have a limited lifespan (Star and Ruhleder, 1994; Neumann and Star, 1996; Star, 1999). By examining community technology through the lens of Neumann and Star, the emphasis is derived from taking account of the socio-technical relationships which enable the 'doing' of 'things' that support the technologies and enable them to support these actions (Neumann and Star, 1996). This work therefore explores the intricoes of the socio-technical 'background work' by firstly examining aspects of adoption by taking into consideration how community technology is established, how a sense of ownership is formed, how technology is operated and maintained, how trust is built through time and the implications these aspects cumulatively have on the sustaining longitudinal adoption of community technology. Similarly, the role of governance has received very little attention in prior literature and has typically fallen on a single individual to take control, as exemplified through Taylor *et al.* (2013) and the community champion. However, what happens when community technology is implemented at scale and when there is a necessity to distribute the workload beyond a single individual? What aspects of governance emerge from longitudinal community technology deployments where there are multiple stakeholders and how can aspects of responsibility, accountability, capacity, trust and transparency be designed for? It is with these two aspects in mind where motivation lies to further expose the 'work' which takes place as part of deploying community technology, in relation to adoption and governance, and understanding how technology could be better designed in the future to take account of these aspects in order to aid sustainability.

In support of the context for which each case study exists, case study one explores the literature surrounding pervasive (public) display as community technology (see chapter 3), with case study two more closely examining public engagement methods for engaging with communities (see chapter 6).

3) Rural Displays: Context & Methods

In order to understand how community technology can be designed for adoption and governance there needs to be a concentration on longer-term research studies. Only with a prolonged research study spanning a number of years (as opposed to a number of months) will help to build a valid account of how adoption and governance impact on sustainability. In light of this, the first case study builds on an already longstanding research project which exists in rural Northumberland in the North East of England. The project being built upon is the deployment of a network of community displays which were implemented in collaboration with a local NGO to help overcome the social exclusion of youth in the summer of 2015.

Throughout this chapter I explain and justify the pragmatic action research approach (Hayes, 2011) which was adopted as part of the work undertaken in this context, with each stage of planning, action and reflection explained in correspondence to the activities which took place. I then reflect on the related literature associated with the technology developed (public displays). In the following chapter, I elaborate on the research activities which took place as part of the first action research cycle which form much of the background for the work conducted in chapter 5) here I provide a detailed overview of the second iteration of action research which sees two display networks launched with reflection across their entire timeline which examines the development of governance, operational planning, community tensions, appropriation and ownership.

3.1) Rural English communities

In 1875, England and Wales established Sanitary Districts under the Public Health Acts of 1873[4] and 1875[5]. There were two types of district defined as part of this new classification; Urban Sanitary Districts were established in towns which had existing local government bodies

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[4] https://www.parliament.uk/about/living-heritage/transformingsociety/towncountry/towns/tyne-and-wear-case-study/about-the-group/public-administration/the-1848-public-health-act/
[5] https://www.legislation.gov.uk/ukpga/Vict/38-39/55/contents

and Rural Sanitary Districts were formed in the remaining areas where Poor Law Unions[6] had previously been in place. A Poor Law Union was a classifier of geographical territory which had been established by local government and provided "a welfare state in miniature, relieving the elderly, widows, children, the sick, the disabled and the unemployed and underemployed" (Blaug, 1964). The Local Government Act of 1894[7] created a system of urban and rural districts which each comprised of a locally elected council. The act also established Parish Councils in rural areas. Rural districts still operated in the same way as the earlier Sanitary Districts however there was now a wider authority over many matters which included planning, housing and recreational areas. Larger matters such as public roads and educational provisions were dealt with at the higher council level.

At this stage under the Local Government Act of 1894, there were 787 rural districts across England and Wales which were based entirely on the Sanitary Districts and Poor Law Unions that had been previously defined. The Local Government Act of 1929 saw the number of rural districts reduced to 473. In total, 236 rural districts had been either removed or merged with larger units. Later, the Local Government Act of 1972[8] saw all rural districts abolished with the rural territories they once represented merged with nearby urban districts or boroughs which left the United Kingdom with a new two-tiered system consisting of 45 counties across the United Kingdom, which are still in use today. Counties vary in geographical size however it is important to note that they encompass large built up and densely populated areas such as cities and districts. Counties also include many smaller less densely populated areas such as towns, villages, hamlets and isolated dwellings, as well as expanses of land which are uninhabited.

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[6] http://www.victorianweb.org/history/poorlaw/plintro.html
[7] https://www.legislation.gov.uk/ukpga/Vict/56-57/73/contents
[8] https://www.legislation.gov.uk/ukpga/1972/70/contents
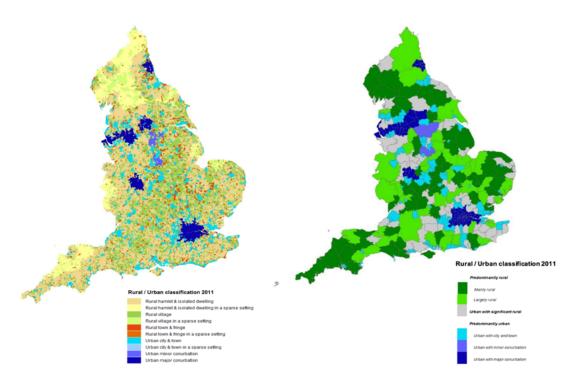
Figure 1 Census output from 2011 illustrating population density (left) and rural/urban classification (right).

(DEFRA, 2020)

The classification system imposed by The Department for Environment Food and Rural Affairs defines areas as rural if they fall outside of settlements with more than 10,000 resident population (DEFRA, 2020). The 2011 census output illustrates the less densely populated areas of the United Kingdom (Figure 1) as well as the rural/urban classification map as a result.

Traditionally, in rural areas, the main occupation of people residing in less densely populated areas was farming and agriculture. Prior to World War 2 (WW2), agriculture was in a poor state with much of the land available reverted to pasture. At this time, the United Kingdom was importing 55 million tons of food per annum. At the outset of WW2 in 1939, the amount of food imported into the United Kingdom was cut to 12 million tons. Rationing was introduced in 1940 which compounded the availability of food available across the country and government initiatives were introduced to encourage people to grow their own food in a bit to reduce demand on imports and reliance on other countries. Naturally, farmers strived to increase production which was helped by government initiatives such as the Women's Land

Army[9] which saw women drafted to take the place of men in rural agriculture. WW2 proved to be a turning point for agriculture, with many new Acts introduced after war had subsided to strengthen farming and agriculture; clearly, the importance of farming had been realised. Many of these acts (e.g., The Agriculture Act 1947[10] & Agricultural Holdings Act 1948[11]) revamped agricultural law and gave security to farmers, their land and their product. With these new laws in place, agriculture and farming in the United Kingdom progressively boomed. Changes through the years that improved the way farmers cultivated their land and subsidised pricing, agriculture was becoming more productive, profitable and sustainable. At the time of writing, farming generates an income of approximately £5 billion however the rural landscape also houses businesses and micro enterprises that are often unrelated to farming which employs 70% of workers in rural areas of England.

Throughout the 20th century, there has been a steady increase in the population of rural areas in the United Kingdom. The rate of increase is much more dramatic than the population grown experienced in the already heavily populated urbanised areas. For example, in 1960 the rural population was approximately 41.1 million which has risen to 53.8 million in 2015; in comparison, urban populations have remained far more constant with their population fluctuating between approximately 11 million and 13 million[12]. However, these statistics do not explain that the vast majority of the population growth has taken place in 'accessible' rural areas. Accessible rural areas are characterised as sitting just outside of urban boundaries and still have good transport connections, infrastructure, access to education and health care provisions. 'Remote' rural is a separate characterisation of rural areas that are located even further away from urban boundaries with historically greater challenges. One such example of

[9] https://webarchive.nationalarchives.gov.uk/20130123215722tf_/http://www.defra.gov.uk/food-farm/farm-manage/wages/wla/
[10] https://www.legislation.gov.uk/ukpga/Geo6/10-11/48/contents
[11] https://www.legislation.gov.uk/ukpga/Geo6/11-12/63/enacted
[12] https://www.statista.com/statistics/984702/urban-and-rural-population-of-the-uk/

a remote rural area is Northumberland located in the North East of England and, in contrast to accessible rural areas, is characterised by a declining population. In remote rural areas, the rural-urban depopulation can spiral into a cycle of rural decline (Figure 2) if there is no intervention.
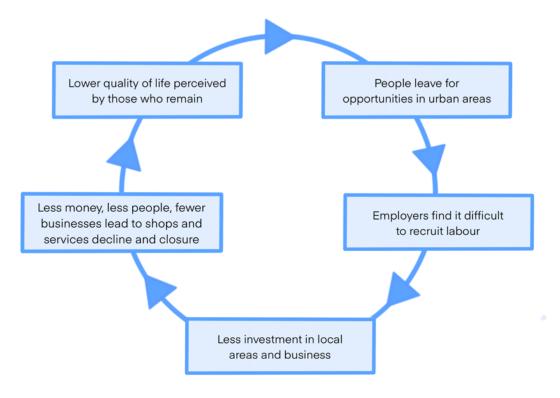
Figure 2 The cycle of rural decline [13]

In areas that can be classified as remote rural there are a number of additional challenges for communities that can be summarised by 6 themes:

Location: Remote areas are typically located far outside the boundary of accessible rural areas which results in poor transport or unreliable transport services. This impacts individuals who have a higher proportion of their expenditure on transport. In a time of austerity and cuts, public transport operators have cut rural bus services which further compounds rural living and potential tourism.

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[13] https://www.coolgeography.co.uk/gcsen/EW_UK_Rural_Changes.php

Education: Access to education can be challenging in remote rural areas due to poor transport links as well as the cost of sustaining schools when there are few students attending. Generally, students will have to travel further to more accessible rural areas when moving into secondary education, sixth form or colleges. Students are generally required to move into urban environments in order to attend University.

Employment: There are severe restrictions on the availability of employment opportunities in remote rural locations. This results in a high proportion of people working in agricultural or farming related careers or moving to more urbanised areas in search of more diverse employment opportunities. Pay in rural areas generally tends to be lower with greater incidence of poverty. "Low pay is more prevalent and more persistent in rural areas than in urban, while living costs are higher" (Centre for Rural Economy, 2014).

Health Care: Rural areas exhibit certain distinctive socio-economic features. There is a trend for people who have retired to move to the countryside resulting in a disproportionate amount of older people residing in rural locations. With this shift to a more aged population in rural environments comes a number of additional challenges including increased demand on an already disproportionately small rural health care workforce, higher proportion of individuals with chronic disease and long-term illness and general reduced access to health care services.

Housing: Due to the increasing trend of people moving to accessible and remote rural areas, there has been a steep rise in the cost of homes. Affordable housing initiatives have been implemented in many remote rural areas however these have had little impact and there are calls for increased investment in affordable housing schemes. To further impact rural housing, there is generally a shortage of affordable rented housing or social housing available. "Lack of appropriate housing reduces the available workforce and stifles the contribution that rural areas could be making to national growth" (Centre for Rural Economy, 2014). Further impacting

housing in rural areas is the availability of efficient fuel with many rural areas falling outside the boundary of where gas companies are prepared to supply leading to higher rates of fuel poverty than urban centres (Centre for Rural Economy, 2014).

Technology Infrastructure: People living in remote areas are severely limited by poor telecommunications and the rollout of high-speed broadband internet services. As the world progressively steps closer to integrating technology into every aspect of life, the integration of technological infrastructure begins in the densely populated urban areas and then slowly seeps into more rural areas. This phenomenon has been widely documented as the 'Digital Divide'[14] describing how urban communities are prioritised with new technology, services and supporting infrastructure.

At the time of writing, there are a number of policies in place which are attempting to tackle the aforementioned challenges[15], as well as recent government guidance for how new policies can be established to better accommodate rural communities and challenges (Defra, 2017). The Rural Development Programme for England (RDPE) (RDP Economist Team, 2014) was established in 2014 and set out to promote rural economic growth by improving the rural environment and increasing productivity and efficiency of rural business (inclusive of farming, agriculture and forestry).

However, despite government schemes, initiatives and policies, change is inevitably a slow process and requires support from more localised groups who are based in these rural areas. Therefore, many of the actions which took place at the citizen level were established, serviced and implemented through non-profit organisations (NGO's) (e.g., Action with Communities in Rural England -ACRE[16]). A NGO's role in promoting economic growth was to highlight localised problems and realise ideas for how local projects and initiatives could

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[14] https://21stcenturychallenges.org/what-is-the-digital-divide/
[15] https://www.gov.uk/government/publications/2010-to-2015-government-policy-rural-economy-and-community/2010-to-2015-government-policy-rural-economy-and-community
[16] https://acre.org.uk/

serve to overcome these problems, with the financial support provided by the RDPE grant scheme (e.g., RDP Economist Team, 2020).

3.2) Community-based action research

Supporting both urban and rural communities has been a longstanding concern of Human Centered Computing (Kavanaugh, 2012). One example is the Blacksburg Electronic Village (BEV) launched in 1994 which was at the centre of a plethora of early technology engagements including; LiNC (Chin and Rosson, 1998), a project which examined the utility of networks for enabling collaborative learning in student groups with community mentors and Civic Nexus (Merkel *et al.*, 2004); an initiative to help community members learn about technology solutions in community groups and organisations (Carroll and Rosson, 2013). Other community projects which stemmed from the BEV include Blacksburg Nostalgia, Teacher Bridge, MOOsburg, Community Sims, CiVicinity and Wireless State College (Carroll and Rosson, 2013) which all equally serve as useful community informatics projects. Despite all these aforementioned projects focusing on varying configurations of technology and community, the employed approaches to these initiatives helped Carroll and Rosson to unearth critical success factors for collaborative community working.

Carroll and Rosson summarised the lessons learnt from BEV in five themes which broadly outlined the characteristics that determine successful work with communities, in a community setting or context. Four of these characteristics were *visibility*, *infrastructure*, *place* and *participation* with the fifth theme depicted as *methods* which links the aforementioned four themes together by drawing on the approach of participatory design (Carroll and Rosson, 2013) which was configured for the studies that took place in Blacksburg:

Visibility: Ensuring community structures and activities are made more visible through community engagement and increasing mutual visibility of existing organisations and their efforts, that have overlapping needs and resources. The researcher is responsible for collecting,

concentrating and visualising community issues to uncover hidden community assets, such as technology-based goals, initiatives and skills. By increasing visibility of hidden efforts, workflows and processes it encourages community stakeholders to understand where they can contribute.

Infrastructure: Encouraging appropriation and ownership of new or existing infrastructure and enhancing or extending existing activities that embody community identity.

Place: Embracing a place-based approach to research to enrich the interpretations and goals associated with community content and activities.

Participation: Encouraging stakeholder involvement to make them partners or contributors so that initiatives can leverage both community knowledge and motivation. Encouraging ownership and engagement with studies over prolonged periods of time allows stakeholders to build meaningful and resilient relationships where trust becomes a resource and not an objective (as with smaller studies); this allows expectations to become a mutual concern and also promotes reciprocal learning whilst empowering stakeholders.

Methods: In BEV, participatory design is as an effective method of engaging communities by working directly with stakeholders to understand their needs and interests, design and deploy technology prototypes and observe and discuss the use, experiences and other concomitants of the prototypes (Carroll and Rosson, 2013). This approach facilitated a dynamic and adaptive methodology that could react to the real world and the always changing community context.

Two projects in particular which took place in BEV (LiNC and Civic Nexus) also adopted action research at the point at which it came time to transfer the ownership of technology and new processes to local stakeholders (Carroll and Rosson, 2013). Action research and participatory design are very similar as they "stem from the notion that change should be designed and implemented democratically and inclusively. However, the scope of

participatory design is typically more limited to the design of solutions, whereas the scope of action research includes the notion of learning through action" (Hayes, 2011). Action research is a superiorly pragmatic means of conducting research 'in the wild' yet still reinforces the five core themes outlined by Carroll and Rosson for effective, manageable and sustainable community research and engagement.

3.3) Action research

Action research is an iterative inquiry process that balances problem solving actions implemented in a collaborative context and was first coined in 1944 by psychologist Curt Lewin (Reason and Bradury, 2001). Since then, action research has been widely adapted and applied in a diverse range of disciplines including educational practice, wider social sciences and computer science. More specifically, in the past decade, action research has surfaced in popularity in the field of Human Computer Interaction (Hayes, 2011). Action research is an approach that works alongside stakeholders and members of the community (Hayes, 2011) and prioritises individuals who reside in those communities as experts in their own domain. The process of action research allows the researcher to iteratively learn, design, deploy and improve their ideas so that they can best configure them to the particular scenario or context it is being applied.

Action Research utilises the iterative cycle of inquiry (Figure 3) consisting of three main activities; plan, act and reflect. The planning stage demonstrates a high level of scientific rigor because of the rich information it accumulates through continuous engagement and integration; something which often has limited depth when only preliminary interviews or focus groups have been carried out when utilising other approaches such as participatory design. The second stage of 'acting' facilitates the deployment of an intervention, technology or process as a local solution to a local problem however, the end-solutions which are implemented still serve as a contribution to knowledge by presenting these solutions as more

generalisable frameworks which can then be applied to other situations outside of a local context. Lastly, the reflection stage affords the opportunity to analyse implementations from the previous step which can then be critically evaluated with the understanding that the engagement-intensive research continues, and the action research iterative spiral can begin again to further improve and refine solutions for community problems. As part of this reflection process, action research also considers the role of the researcher themselves as a part of the solution which leads to further refinement by reflecting on their own influence, position, skills and experience and the impact this has on the community and any longitudinal implications for the sustainability of solutions.

Action research facilitates the researcher embracing the role of a "friendly outsider" who can integrate in-situ with community stakeholders so that they can learn, understand and conduct research activities, as opposed to designing and implementing research about them (Greenwood and Levin, 2007; Hayes, 2011). Most critically, the opportunity to integrate with partners allows the researcher to understand their research implications from the perspective of the 'end users' or 'the person who will be left to use the technology'. The 'end users' are not characterised by their traditional meaning as a 'consumer' or 'customer' but are instead considered citizens or regular individuals who are members of a community and who have expert domain knowledge. In a rural context for my preliminary case study, an action research approach will grant me the opportunity to grasp the complexities of the very unique situations that research partners are in including the challenges they face, their routines, working practices as well as the social norms which are present in each respective community. In this sense, action research is closely intertwined with the approach outlined by Digital Civics literature which adopts a human-centered and participatory approach to connect with citizens, providing a rich understanding of challenges whilst returning systems and services that are meaningful and helpful (Olivier and Wright, 2015). As Taylor, Carroll and Rosson noted when outlining

the fragile nature of working with communities, designing and deploying community technology requires working intensely in close proximity with research participants, to ensure successful adoption (Carroll and Rosson, 2007; Taylor, 2011).
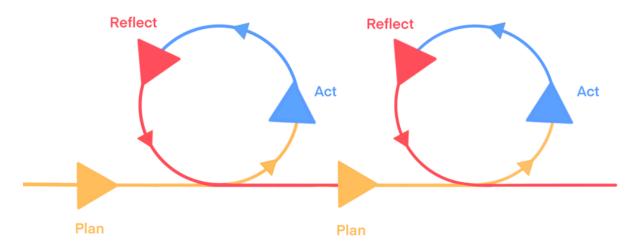
Figure 3 The Action Research cycle consists of three separate stages; planning, acting and reflecting. Adapted diagram originally illustrated in (Hayes, 2011)

I adopted the role of the action researcher because I was embedded into the community of Glendale and Rothbury (see chapter 3.6) from the point of initial contact. Action research was conducted and maintained through a combination of means: the high number of visits and trips to each location, participation in the community engagements and activities conducted for the purposes of the case study, involvement in the wider community activities as part of the normal routines of those who lived in these communities, as well as building personal relationships with stakeholders which helped to build trust dynamics. For example, I initially attended a single annual music festival in the Rothbury town centre to support the launch of the display network however, I returned each year for another four years in order to support the community and because local residents now recognised me. On other occasions in Glendale, I became the go-to technical expert for the Glendale Gateway Trust community hub where I voluntarily helped maintain computers, laptops, update servers and provide guidance on their newly installed digital teaching hub. Whilst it was not necessary that I do this, my

willingness to engage with the respective communities embedded me deeply into the routines and day-to-day activities so that I could thoroughly understand what it was like to live in these communities, and therefore more concretely understand what opportunities and challenges were presented. Action research itself is closely aligned to user centered iterative design however, action research has its advantage in that it allows the researcher to become significantly more embedded into the wider societal context of the work undertaken. That is not to state that both approaches are similar in that they 1) prioritise their focus on people; 2) help to find the *right* problem to address and; 3) consider the wider context for which the solution fits, however, action research in this context takes greater account of designs that benefit humanity, society and communities (considered 'social' problem solving) with designs that are usable, rather than being driven by product delivery, the experience of using the end-product and working with smaller or concentrated user groups (considered 'end-user' problem solving) (Abras, et al. 2004).

In the past decade, there has been a steady rise in the number of projects which have adopted an action research approach in HCI research. Action research offers a democratic, collaborative and interdisciplinary approach (Mctaggart, 1994) to conducting research in the field of HCI which aligns itself to scientific rigor and the promotion of sustainable social change (Hayes, 2011). As Hayes states, the ultimate goal of action research is to create sustainable change by conducting projects where communities can eventually take full control of the novel technologies, policy changes or newly developed processes which have been implemented (Hayes, 2011).

3.4) Public displays as community technology

Much HCI research has engaged with communities who are geographically focused in a particular area however, one subsection of HCI literature which has demonstrated a rich and long history of working in such a context is the research area of pervasive displays (also known

as public displays), which has examined how display technology can be utilised in urban and rural communities alike. Pervasive displays have been a core part of the ubiquitous computing vision (Weiser *et al.*, 1999) and much of the literature surrounding it has tended to focus on their technical layouts and the social implications of their design. Following the trends present in HCI across the years, where technology has spread from restricted use cases, such as the workplace (Cheverst *et al.*, 2003; Churchill *et al.*, 2003, 2004), to interweave into all aspects of our everyday lives and culture, as anticipated by Weiser *et al.* (1999). Pervasive display technology has slowly developed to the point where it is invisibly embedded and now serves as an important technological tool for the day-to-day functioning of modern society. For example, in urban environments, shops, restaurants, highstreets and public areas (Figure 4) are increasingly using digital signage boards for the purposes of advertising and/or public information points.
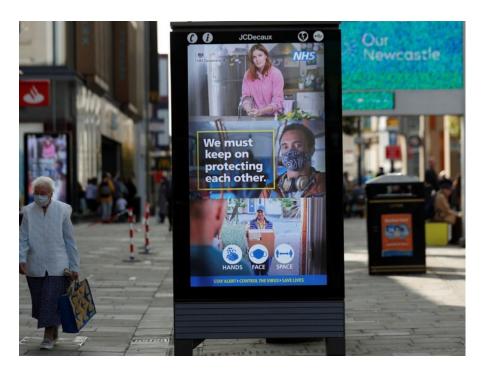
Figure 4 An example of a Public Display on Northumberland Street, Newcastle Upon Tyne, July 2020

In the past two decades, a number of research projects have seen variations of pervasive displays implemented in urban spaces. Cityspeak (Lévesque et al., 2006) provided people with

the opportunity to directly engage with a large format public displays by broadcasting user generated text based content which was then displayed amongst commercial content. At a similar time, Storz *et al.* (2006) had iteratively developed and deployed a series of large displays which ran across a number of locations based around a University Campus. 'E-campus' was deployed for the purposes of presenting conference notifications, exhibition material and informational and interactive content across the respective deployment locations in a bid to determine important factors for consideration when deploying displays in public spaces. City Wall was an initiative hosted in Helsinki which saw large format displays deployed in public spaces to firstly inform people about events in the city and then promote participation by prompting interaction at the time of the event, such as posting photos taken on mobile phones (Peltonen *et al.*, 2007). A similar project by Muller and Kruger saw mobile phones used to measure audience engagement and participation to content being shown, by implementing a novel coupon system (Muller and Kruger, 2009). Alt, et al. (2011) designed and deployed a network of 'Digifieds' in Oulu, Finland, as an urban experiment as a part of the global R&D community Challenge (Ojala *et al.*, 2010; Alt, Kubitza, *et al.*, 2011; Ojala and Kostakos, 2011) designed to investigate ubiquitous computing within society. Digifieds were effectively large format public displays which housed other computing resources such as a wireless access point, infotainment services and other internet components.

Past literature has highlighted some of the limitations of using public displays in populated areas including phenomena such as display and interaction blindness. Display blindness was coined by Müller *et al.* (2009), who drew attention to the greater availability and visibility of display technology in public spaces and how this did not necessarily relate to the displays receiving an equal amount of viewing time. Interaction blindness is the cumulative effect of display technology becoming so ubiquitous that it exists all around in every aspect of life, and with that availability and over exposure of displays comes the problem that people not

knowing or understanding if particular displays are interactable or not (Du *et al.*, 2016). However, when thinking about display technology as a permanent installation whereby they support a particular purpose or activity in their environment, there are understandably other factors that need to be considered that extend beyond the aspects of functionality, novelty of implementation and techniques of engagement.

3.5) Community displays and sustainability

With the majority of technical boundaries solved using novel solutions for public display engagement and implementation (e.g., Baldauf and Fröhlich, 2013; Clinch, 2013; Dingler and Schmidt, 2015), attention turns to examining the social configuration issues of community technology including aspects of privacy, governance and sustainability. Clinch *et al.* (2013) explored the technological implications of running an open, scalable display network with no centralized control through the Yarely software player. The Yarely software player was designed with openness in mind to accommodate content from numerous sources, as well as being easily appropriated for multifunctional use whilst minimising downtime through server decoupling. Alt, *et al.* (2011) highlighted issues of privacy and public sharing of personal data in their display deployment within two urbanized public spaces within Oulu, Finland and Peltonen *et al.* (2008) investigated how social roles emerge through interaction with their multi-touch City Wall display. Understanding how roles emerged from a single instance of a community accessible display help demonstrate the importance of people and the tasks they carry out in the configuration of displays. Longitudinally, it's even more important to consider the role people play if technology is going to be deployed on a long-term basis, rather than a short study. Hosio *et al.* (2014) notes that there must be a concerted effort put towards the resources used to sustain display technology longer term, given how relatively easy it normally is to 'sell' the concept of introducing a display network that 'supports a good cause'. Taylor *et al.* (2013), explicitly highlights the role of community stakeholders and the role they play in

public displays whereby they utilise their own skills, time and effort as a major contributing factor for sustaining technology. As part of this thesis, I am concerned about the social and technical aspects of the design of community technology and how these evolve and interact over the time from initial researcher engagement with civic communities, through to the appropriation and domestication of the technology as it becomes established `in the wild'.

Research projects such as Neighbourhood Nub, or 'Nnub', (Redhead and Brereton, 2009) deployed display technology in a community hub to allow local residents and school children to upload and share classified advertisements and local information and news. Big Board (Maunder, Marsden and Harper, 2011) supported free media sharing for users at a "Learn to Earn" facility which provides members of the local community with access to skills development courses which is managed through an NGO; StoryBank (Jones *et al.*, 2008) enabled users to upload audio-visual content for rural digital storytelling and Soro *et al.* (2015), explored how the design and implementation of digital noticeboards could bridge the gap between rural aboriginal culture and western society.

The StoryBank study is particularly significant as it's one of the first studies that highlighted participants' concerns over the longer-term moderation of content and technical support once the research study concluded. Since the StoryBank deployment, issues concerning sustainable engagement and use has been taken up more widely in the literature. For example, with their Wray Photo Display deployment (Taylor and Cheverst, 2009, 2010b), Taylor *et al.* (2013), specifically aimed at designing for the sustained use of community-run public displays following their eventual handover to the community. In their study, they describe how the short-term of the research project was a barrier to sustainability, resulting in poor software robustness and reliability, which demanded skills that were unavailable in the local community. In this regard, making use of commercially available products rather than designing bespoke technology can reduce the digital literacy and skillset requirements for long-term use and

maintenance. Nevertheless, financial resources can also be a barrier to sustainability (Taylor *et al.*, 2013) whereby aspects such as on-going server subscriptions and replacement hardware (O'Hara, Perry and Lewis, 2003) can become unmanageable in the absence of a formal arrangement for funding once research projects end. Hosio *et al.* (2014) recognises that display technology is more affordable than it has ever been before, with the ever-falling costs of capable off-the-shelf hardware to establish and run display networks, but this as a sole factor in itself does not directly equate to having a *sustained* deployment. Hosio et al. (2014) argues that display technology itself is still just as expensive as it has ever been, just now the costs of electricity, internet, insurance, cleaning and upkeep are somewhat 'hidden' by being seemingly distributed as lots of separate 'negligible' costs. Great care should be taken when establishing display networks so that these 'hidden' costs and efforts are made explicitly clear, as well to prevent a mismatch between the researcher's goals and those of the research participants (Taylor and Cheverst, 2010b). Therefore, in order to overcome challenges to sustainable use, technologies should be iteratively developed with communities through long-term engagements (Memarovic *et al.*, 2013; Taylor *et al.*, 2013). More broadly, there is a distinct lack of longitudinal studies which examine aspects of sustainability for community technology over prolonged periods of time.

Community ownership of a technology is an important element to its sustainability. Balestrini *et al.* (2014) highlighted a series of impact indicators used to determine the success of longitudinal technology deployments within a community, which came about by their own deployment of CrowdMemo (as a tool for the "collection of user generated microdocumentaries that present stories [about local heritage]"). Balestrini emphasised the importance of keeping stakeholders involved and engaged from the start, by following research guidelines laid out by action research principles, maximising wider community engagement and advertising about the design of the technology and it's use, as well as positively aligning

any kind of media coverage of the technology alongside community principles and motivation. Evidently, building digital technology for community ownership and appropriation (Balestrini *et al.*, 2014) demands an understanding of existing behaviour and practice (O'Hara, Perry and Lewis, 2003; Alt, Memarovic, *et al.*, 2011), as well as consistent use, enthusiasm and engagement from the community once it has been deployed (Hosio *et al.*, 2014).

Research has demonstrated that outlining a clear purpose (Clinch *et al.*, 2011) and promoting the launch of community technology (Memarovic *et al.*, 2013) is beneficial to its acceptance. Hearn *et al.* (2005), identified the need to consider the social infrastructure for ensuring sustainability. Engaging with enthusiastic and motivated community participants to play key roles in the management and use of the technology can aid in sparking wider community interest (Izadi *et al.*, 2005). However, maintaining long-term engagement from such enthusiastic community participants, or 'administrators', must "offer real concrete value" (Hosio *et al.*, 2014). Although this might be effective in the short term, the transfer of responsibility and upkeep to a single individual who has the necessary skills is not sustainable due to the risk of `burning out' (Redhead and Brereton, 2006). While stakeholder support is undoubtedly beneficial, the overall workload should be distributed within the community (Taylor *et al.*, 2013) to ease the management burden and enhance community involvement. Here, research has investigated ways that this might be achieved, for example through the development of relevant skills within the community (Merkel *et al.*, 2004) or by applying lessons learned from how content is generated by online communities on social media platforms (Memarovic *et al.*, 2012).

3.6) Methods in context: community display network in rural Northumberland

In the following subsections, I contextualise the approach of action research for the first case study which consists of working with two separate rural communities based in the North East of England. This case study consists of two iterations of action research and I structure the

remainder of this chapter to reflect each stage of the spiral of activity as depicted in section 3.2) (Figure 3).

3.6.1) Northumberland and the Glendale Gateway Trust

Northumberland is a 1935 square mile expanse of mostly rural landscape located in the North East of England. The area is one of the least densely populated areas in the whole of England comprising of approximately 321,000[17] inhabitants (Figure 5). Whilst a fair proportion of people living in Northumberland are distributed along the outskirts in more densely populated larger towns such as Blyth, Cramlington, Ashington, Bedlington, Morpeth, Berwick-Upon-Tweed, Hexham and Prudhoe[18], the remaining population of residents reside deeper into rural Northumberland which is made up of small villages, farmland and open space. For a long time, Northumberland has been a very popular choice for people looking to retire and move to the countryside, a distinctive trend best illustrated by the rise in resident's average age to over 45[19].

Rural communities in the United Kingdom, such as Northumberland, are often characterised by a number of factors including reduced access to medical facilities, education provision, welfare and leisure options and public transport[20]. Gaining access to these resources is further compounded by the vast physical distances between neighbouring towns and villages as well as the often-poor reliability and high cost of public transport. Historically, the cost of housing in areas of Northumberland have been rising with the upward trend of people retiring to the area; this has some hope for those looking to buy a first home in the area[21] however there is still a distinctive lack of 'affordable housing'.

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[17] https://www.plumplot.co.uk/Northumberland-population.html
[18] https://www.citypopulation.de/en/uk/northeastengland/
[19] https://www.plumplot.co.uk/Northumberland-population-changes.html
[20] https://www.local.gov.uk/sites/default/files/documents/1.39_Health%20in%20rural%20areas_WEB.pdf
[21] https://www.ons.gov.uk/economy/inflationandpriceindices/articles/housepricesinthenortheastofengland/2007to2017

Figure 5 Northumberland population distribution demonstrating that the vast majority of the geographical area inhabited by <50 residents per km². [22]

The issues highlighted here and those more broadly identified in section 3.1) typically impact more significantly on younger people who have grown up in Northumberland. For example, employment opportunities typically extend to agriculture, livestock, transport and retail. Affordable housing is in short supply in Northumberland and access to further and higher education is typically restricted by the large distances to more major towns residing on the outskirts of Northumberland (for example, Berwick-Upon-Tweed and Newcastle-Upon-Tyne). Whilst many young people possess electronic devices such as phones, tablets and computers, there is typically poorer access to a fast and reliable internet connection or strong phone signal capable of transmitting mobile data in rural areas. However in recent years there have been significant improvements with the narrowing of the digital divide (Taylor and Cheverst, 2010a). Traditionally, more urbanised locations have been given priority for digital services' renewal and upgrade. For example, Wooler, one of the main towns located in the centre of

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[22] http://www.plumplot.co.uk/Northumberland-population.html

Northumberland where a larger proportion of research was carried out as part of this case study, only received fibre optic broadband shortly before research commenced in the area circa 2014.

Wooler, as one of the more central towns in Northumberland, is home to the Glendale Gateway Trust (GGT); a small charitable community development trust which serves as a central hub for many of the residents that live in the area. GGT operates from The Cheviot Centre in Wooler providing access to free and fast broadband internet, library services as well as hosting a diverse range of interactive remote learning sessions. The Trust is highly engaged in projects that have a local impact, and that address the needs of the wider community. For example, from 2015, the Trust has hosted a series of all-inclusive business pods (Kleinhans *et al.*, 2020) which have been made available to start-up businesses at a reduced rate in a bid to attract and retain new businesses in the immediate area. Similarly, the Trust provides advice and guidance for job seekers and is actively involved in organising key events and workshops which address community needs, typically working towards addressing rural isolation and encourage social and physical activity, as well as mental well-being. The Trust is particularly active in renovating and repurposing properties in Wooler and the surrounding area to provide more affordable housing opportunities for young people. The Trust also have a number of initiatives that aim to tackle the lack of sustainable employment, recreational activities, reliable transport and perceived lack of community initiatives for young people.

3.6.2) Youth, community and community displays

A lot of Glendale Gateway Trust's work towards young people has been in response to the results of a study and public report[23] undertaken by the Trust in 2013 which unearthed significant insights into the problem of rural-urban flight. Rural-urban flight in this context is exemplified by the departure of young people from Wooler and the surrounding rural areas to

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[23] https://www.sruc.ac.uk/info/120487/langholm_and_glendale_stayin_alive

larger towns and cities such as Newcastle-Upon-Tyne and Berwick-Upon-Tweed, in search of greater opportunities.

The issues identified in the report highlighted the effect of rural living in Northumberland and how this is experienced by younger people. The report also highlights how young people were largely unaware of many initiatives, existing services and the majority of activities in the local area; there was a lack of visibility of localised opportunities. These insights prompted Glendale Gateway Trust to develop a new strategy for how they reach out and engage the younger generation in Northumberland's rural communities. Shortly after the 'Stayin Alive' report in 2013, the Trust took the initiative to develop and launch a series of publicly situated photo frames as a means of overcoming this phenomenon.

Glendale Gateway Trust used a series of digital photo frames to try and overcome some of the problems that were being faced by young people in the area. The digital photo frames used were a similar size to a 15-inch diameter computer monitor (Figure 6). In total there were six deployed individual photo displays which were manually updated by inserting an SD card (Figure 7). The task of updating the content was normally carried out by a member of the Trust's staff who would routinely visit each photo frame location to collect the memory card and later return with it updated. This would normally happen once or twice per week depending on the workload of the Trust at the time.

Content for the photo frames was typically created using Microsoft PowerPoint and took the form of informative slides with text and images which were exported as JPG[24] or PNG[25] image directly to the memory card. The images were typically cropped to 1280x1024 landscape resolution however on occasions, content was sent in from members of the community and uploaded directly which caused inconsistencies in display formatting,

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[24] https://www.paintshoppro.com/en/pages/jpg-file/
[25] https://www.paintshoppro.com/en/pages/png-file/

resolution and aspect ratio on the photo displays. Each image that had been loaded onto the photo display was displayed in a continuous carousel which allowed 20 seconds between each transition onto the next image. Image content was specifically tailored for young people to provide them with information about local initiatives, clubs and social events with a view of trying to retain young people in the area by making them more aware of localised opportunities. Images also included information that was relevant to parents and carers and took the form of directions, rough travel times, locations and pickup times. Information on the photo frames came in the form of local leisure opportunities, part-time and full-time employment vacancies, social events, local initiatives and other information relating to Northumberland Council Youth Services[26]. The Trust thought that by enriching young people's experience of living in Northumberland, it would make it more attractive for young people and take a small step towards helping to retain them in the area.

Figure 6 Digital photo frame used by GGT prior to any research beginning in Northumberland

In total, the Trust deployed six digital photo frames (Figure 8) at a variety of public locations. The public locations were chosen because they attracted footfall from young people and were considered accessible; that is, they served as a 'hub' where young people likely

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[26] https://www.northumberland.gov.uk/Children/Young/Northumberland-youth-service.aspx

congregated, passed through or visited occasionally. These locations included Glendale Middle

School[27], Etal Village Store & Tea House[28], Lowick Village Store[29], Millfield General Store[30],

Glendale Gateway Trust[31] and Wooler Youth Drop-in Centre[32]. For example, Etal and Lowick

Store had regular footfall from youth who visited the store to buy snacks either before school

when waiting for the bus, or after school when returning.

Figure 7 SD card content loading on a digital photo display used by GGT prior to research beginning in

Nothumberland

Despite the good intentions of the photo displays, the Trust quickly found that they

were proving difficult to manage and maintain in the long-term. Firstly, updating content on

the photo displays took over three hours due to the time taken to drive to each display, pick up

each memory card, return to the Cheviot Centre, update each memory card individually with

new content and then drive out to each display in order to return and re-fit the memory cards.

The updating of content was a large administrative burden for the Trust. Driving such long

distances incurred fuel expenses for staff who typically used their own private vehicles as well

as the paid time taken from a staff's normal working routine to complete the content update

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[27] http://www.glendale.northumberland.sch.uk/website
[28] https://www.ford-and-etal.co.uk/shops/ford-village-shop/
[29] https://www.facebook.com/LowickVillageStore/
[30] https://www.northern-trader.com/
[31] https://www.glendalegatewaytrust.org/
[32] https://www.facebook.com/Wooler-Drop-In-Centre-1701054026776300/

process. Because of these time and cost limitations, the Trust decided to update the photo displays only once every fortnight which affected how the displays were used. For example, the displays could not be used to display 'critical' information of a time sensitive nature. An example of critical information that the Trust previously strived to update more regularly was changes to bus routes and flooding updates (a common problem in wider rural Northumberland).
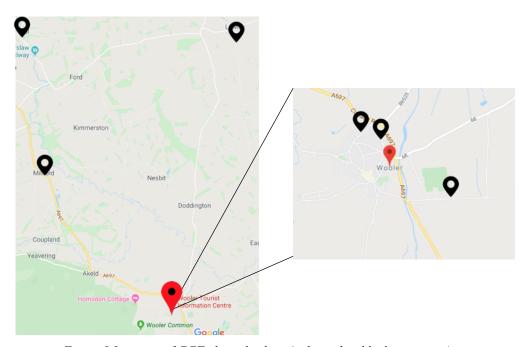
Figure 8 Location of GGT photo displays (indicated as black waypoints)

The collection, sorting and formatting of new content for the photo displays also incurred a large amount of staff member's time. There was no defined procedure or process for how the raw informational content was collected or sourced, or how it made it onto the photo displays, and in which format content should take. Content sourced internally from the Trust via staff members tended to be formatted consistently however external content from other organisations, such as the scouts[33] or local gliding club[34] were irregularly formatted. Some images would be very text-heavy or even lack important information, as well as having poor readability caused by clashing colour and background-image choices.

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[33] https://www.tynemouthscouts.org.uk/powburn-scout-adventure-centre/
[34] https://www.northumbriagliding.co.uk/

This subsection has summarised the photo display initiative which was started by Glendale Gateway Trust as a means of overcoming some of the problems associated with the social exclusion of youth in rural Glendale. This initiative marked the beginning of a long-term relationship between Open Lab, Newcastle University and the Glendale Gateway Trust.

3.7) Action research cycles

Following on from Glendale Gateway Trust's photo display initiative, there were clear drawbacks of using such primitive technology (photo frames) for that particular use case. At this point I was undertaking my Master of Science (MSc) dissertation project at Open Lab, Newcastle University. Open Lab was commissioned by Glendale Gateway Trust in the summer of 2015 to create a more robust solution for the distribution of digital content in rural Glendale. In this summer period I subsequently designed and deployed a primitive system which allowed the Trust to digitally manage and distribute digital content. The following summer of 2016, I evaluated the public diplay network and the deployment as part of my Master of Research (MRes) dissertation project. In late 2016, I started a PhD with Open Lab which allowed me to continue working with the Glendale Gateway Trust and further develop and expand it for application in other rural locations. All together the work conducted in rural Northumberland defines my first case study as part of two distinct action research cycles (Hayes, 2011).
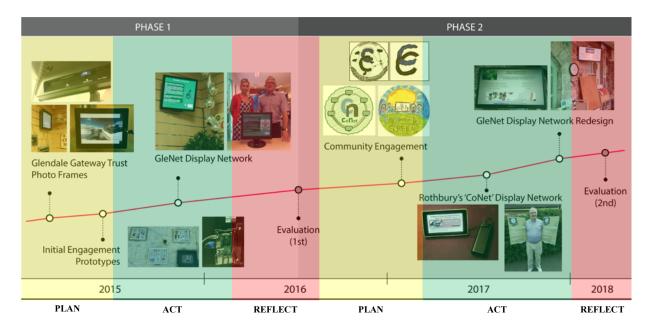
Figure 9 Timeline of Case Study 1 comprising of two action research cycles as highlighted by the coloured overlay (plan, act, reflect)

The work completed prior to August 2016 concludes my MSc and MRes work however is detailed as part of this PhD thesis because it highlights the origins, purpose and context for work completed post September 2016 as part of this PhD endeavour. The diagram above (

Figure 9) represents a timeline of events which are depicted as two phases: Phase one (action research cycle one) encompassing work of the Msc and MRes and phase two (action research cycle two) encompassing work completed as part of the PhD spanning from 2016 to 2018. The remainder of this chapter explains the methods and approaches employed as part of each phase of action research for case study one. Chapters 4 and 5 highlight the details of case study one, where upon there will be a visual reminder of Figure 9 to represent which action research stage is being presented.

3.7.1) Plan. Project configuration (GleNet)

Following on from the 2013 report which highlighted the problem of rural-urban flight in Wooler and the surrounding rural areas, the Trust had applied for and secured additional

funding through the Big Lottery funding scheme[35] in an effort to fund new initiatives to overcome the social exclusion of youth. As part of the larger grant proposal, there was a small budget of £500 (pounds) allocated for the creation of a 'digital solution' which was intended to help distribute information to young people. It was at this point the Trust approached Open Lab[36] seeking support for the initiative. After preliminary discussions the Trust commissioned Open Lab in May 2015 to create a more robust digital display system that mitigated the issues of their own photo display network. This three-month project formed the first full iteration of action research carried out in Wooler, Northumberland which resulted in the creation of 'GleNet' (Glendale Network); a first attempt at a networked digital display system.

The primary stakeholders in this case study consist of two full-time employed members of staff who work at the Glendale Gateway Trust, which is based in the Cheviot Centre in Wooler and which also serves as the local tourist information point[37] (Figure 10). Stakeholder (*G1*) was the director of the Glendale Gateway Trust at the time whilst stakeholder (*G2*) served as project officer, marketing and administrative support for the Trust. Both stakeholders are the authors responsible for the successful Big Lottery Grant application and for the digital photo display initiative. Other research participants in this project include 'hosts' who are members of the community who opted to host a digital photo display unit for Glendale Gateway Trust. Hosts operate out of one of the publicly accessible locations where photo displays were deployed (see 3.6.2) and typically consist of either a shopkeeper, volunteer, business owner or associated staff. Youth involved in the project are young people who typically aged between 16 and 22 who lived in Wooler or the immediate surrounding area. From Open Lab, the project was also assisted by an intern who joined as part of a summer internship program for the three-month duration.

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[35] https://www.tnlcommunityfund.org.uk/
[36] https://openlab.ncl.ac.uk/
[37] https://www.visitbritain.com/gb/

Figure 10 The Cheviot Centre is the central community hub based in the heart of Wooler, Northumberland [38]

Preliminary work carried out in Wooler with stakeholders of the Trust consisted of ethnographic observations and discussions which allowed me to understand the unique rural context I was working in. This consisted of situating myself at the photo display locations so that I could observe them, the people around them and how they were used. From these observations I attempted to understand what existing practices, social norms, routines and processes were in place and how members of the Wooler community and surrounding areas conducted their day-to-day routines, in respect of how people sourced information in rural communities. For example, observations took place at other community hubs such as community notice boards, examining local newspapers and alternative public information points. Interesting observations were logged in a notepad with notes taken in-situ.

Most importantly, informal discussions took place with local residents, hosts and stakeholders with follow-up discussions taking place with the stakeholders so that I could

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[38] *https://ruralvision.eu/en/getting-a-grasp-on-wooler-and-glendale-impressions-after-5-weeks-of-rural-north-east/*

confirm my own understanding and perspective. This was particularly useful when understanding that certain businesses on the high street in Wooler were owned by the Glendale Gateway Trust itself and the businesses (such as Gear for Girls) had a reduced rental rate as a starting business. More formal discussions took place with stakeholders in the form of semi-structured interviews so that requirements for the design of a networked public display could be established. These formal conversations helped to understand the Trust's issues and concerns, as well as set realistic expectations for what was achievable as part of this endeavour. The combination of observations, ethnographic notes and discussions helped to form the first steps towards defining requirements for GleNet.

3.7.2) Act. Design and deployment (GleNet)

An agile software development approach (Figure 11) was adopted for the design and deployment of GleNet as a functional community display network. In this project, the similarities between action research and agile were that they both require a high level of interaction with stakeholders which was able to be maintained by continued community engagements. A strong working relationship had been forged with the stakeholders of Glendale Gateway Trust which eased the process. There was an unspoken acknowledgement on both sides of the relationship that both parties should be contactable to discuss matters pertaining to the design of the system so that time was not wasted travelling the 100-mile round journey between Newcastle-Upon-Tyne and Wooler and back. Agile is characterised by its short incremental development sprints which prioritise stakeholder engagement and inclusion of their knowledge into the process (Beck *et al.*, 2001; Cockburn and Highsmith, 2001). Unlike more traditional software development approaches present in software engineering, such as waterfall which has a relatively low level of stakeholder engagement, agile allows for rapid development whilst maintaining stakeholder engagement. This ensured that the solutions designed were implemented and maintained quickly with minimal hold up from unanticipated

glitches and bugs. In this particular context, the efficiency of adopting an agile development methodology for GleNet resulted in more time being dedicated to building a longitudinal stakeholder relationship.
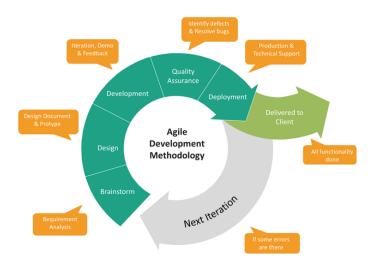
Figure 11 Agile development methodology which caters for iterative design cycles [39]

During the early stages of the GleNet deployment the maintenance and upkeep of the display network were high which incurred numerous journeys between Newcastle-Upon-Tyne and the displays scattered around Wooler. Initially, a lot of the communications surrounding maintenance were reported by the primary stakeholders who had either found issues themselves or they had been reported to them by hosts with display clients. After a short period of time, I had built up a strong enough relationship with many of the hosts who had been experiencing teething problems with their display client to the point where they could contact me directly. Longitudinally it was useful to have a built a working relationship with hosts because it enabled me to identify problems quickly without incurring a delay by navigating through the primary stakeholders, who initially acted as gatekeepers for the project. After approximately six months, many of the issues had been overcome and the system was running stably.

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[39] https://chercher.tech/jira/agile-methodology

3.7.3) Reflect. Evaluation of GleNet

Evaluations took place with four groups of participants (stakeholders, hosts, youth and members of the general public) and took the form of audio recorded one-to-one semi-structured interviews (Sayrs, 1998), ethnographic and observational notes as well as a public questionnaire survey. In total, the evaluation consisted of ten interviews. Of the ten interviews conducted, two were with Glendale Gateway Trust stakeholders (*G1*, *G2*), two with Glendale Gateway Trust trustees (*T1*, *T2*) and the remaining 6 were with display hosts (*H1 – H6*). Surveys were used in a public setting to approach 24 members of the general public in five different locations (Breeze, Cheviot Centre, Cornhill, Etal & Lowick). Surveys were conducted approximately between 9:00 and 11:00 on different days of the week. Usage logs in the form of uploaded content were also downloaded from the content management system in the form of HTML templates that had been filled in with text and images. A summary can be seen below in Table 1.

Data Collection Method	Participants / Quantity	Format
Audio Recorded Interviews	4 GGT Participants 6 Display Hosts	One-to-one
Questionnaire Surveys	Breeze – 6 Cheviot Centre – 4 Cornhill – 8 Etal – 2 Lowick – 4	One-to-one in situ.
Usage logs	185 'Slides'	Complete HTML template pages recovered from server.

Table 1: Summary of data collection method used for GleNet evaluation

All of the interviews conducted were transcribed and analysed using thematic analysis (Braun and Clarke, 2006). The process of thematic analysis allows written data to be coded inductively so that core themes can be generated. The themes generated through this process were then used to form a narrative which references back to the originally transcribed data and participant quotations. As the evaluation took place, the observational fieldnotes that I had recorded helped to contextualise any information that became apparent during the interviews.

Categorisation of Content	Number of Items
Youth Social Club or Event	25
Youth Sports Club or Event	41
Glendale Gateway Trust Event or Promotion	22
Glendale Gateway Trust Announcement	8
General Announcement (Area of Glendale)	28
Adult Social Club or Event	9
Adult Sports Club or Event	4

Table 2 GleNet categorisation of uploaded content

GleNet's usage logs consisting of 185 pieces of uploaded content were taken into consideration as part of the evaluation process with content being categorised by topic. A total of 48 slides were found to be duplicated or very similar to one another so these were emitted from the collection of slides. Each slide was examined one by one to determine the category of informational content it fit into, e.g., a slide promoting a local flying and gliding club was tagged 'youth social club or event. In total this resulted in 137 pieces of content which were grouped into seven separate categories (Table 1).

The evaluation and reflection represent the first action research cycle's reflection stage which took place in rural Northumberland and was written up as part of my Master of Research degree programme which concluded in August 2016.

3.7.4) Plan. Defining new requirements

Research conducted in rural Northumberland from this point on builds on the foundational work completed as part of my Master of Science and Master of Research degree programmes (2014-2016). The action research cycle began again in September 2016 with a new analysis conducted with the data gathered across the previous two year; this included the evaluation data which was pieced together as part of the reflection stage of the first iteration. The intention of this analysis was to derive new requirements that could better address the shortcomings of the first GleNet photo frame initiative and offset factors that arose from its deployment, as highlighted in the first evaluation. The analysis amalgamated observational notes, usage logs

and maintenance issues which occurred across 18 months that GleNet had been deployed in Wooler and the surrounding area. The evaluation interviews conducted with stakeholders, hosts and youth, as well as surveys conducted with members of the general public, aided of the formation of new design requirements for a new display system.

At this stage the plan was to eventually re-deploy in Glendale by simply replacing the old GleNet system with a new updated platform. Early on in the planning process I was invited as a guest to present my account of GleNet at an annual general meeting of the Upper Coquetdale Churches Together (UCCT)[40] group which took place in Rothbury, Northumberland (see section 3.7.4.1). The UCCT is a group of ten churches across four denominations, based in Northumberland, that have agreed to work together in a wide range of projects and initiatives to support the community (*Upper Coquetdale Churches Together*, no date). For the presentation, I invited *G2* as one of the original stakeholders from the Glendale Gateway Trust and one of the stakeholders who had commissioned OpenLab to create GleNet. *G2* presented their independent perspective of the GleNet project and offered their viewpoint on how useful it was as a tool for the Trust. As a result of the presentation, there was significant interest from UCCT members to launch their own display network situated in the town of Rothbury, Northumberland. I began correspondence with *R1,* a retired professional who resides in Rothbury. *R1* is a technically minded individual who is also a proactive member of UCCT and the wider Rothbury community. Through meeting *R1*, I was then introduced to *R2*; a retired individual who is a proactive member of the community who leads on a number of active initiatives in Rothbury (funded by the UCCT). *R1* has lived in Rothbury for approximately ten years and *R2* has lived in Rothbury their entire life. Similar to how I had built a working relationship with the stakeholders of Glendale (*G1* and *G2*), I frequently travelled from Newcastle-Upon-Tyne to Rothbury to meet *R1* to meet and informally discuss the idea of a

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[40] https://armstronghall.org.uk/ucct/

display network, the Rothbury community and try and understand their particular needs. I met less frequently with *R2* however they were still an active stakeholder in the initial stages of Rothbury's deployment. To do this, I kept a diary of my own ethnographic notes which were eventually included into the larger analysis of data from the GleNet evaluation. At this early stage, an approach for how a display network would be established in the town of Rothbury was verbally agreed with *R1* and *R2* and an agreement with *G1* and *G2* was also made to replace their GleNet system with the new, updated display platform.

3.7.4.1 Rothbury, Northumberland

Rothbury is a small town and civil parish located in Northumberland and sits on the river Coquet. It is approximately 26 miles from Newcastle-Upon-Tyne and has an approximate population of 5,017 people (Public Health England, 2014). Rothbury is a rural community (see section 3.1)) and draws many similarities to Wooler (see section 3.6)) in respect of its aging population, transport links and education provision. In 2014, Steve Hurst launched a remote-rural bus transport company[41] to aid Northumberland residents who did not have the means to travel from some of these more rural surrounding villages to central Rothbury in order to obtain transport. However, the company was forced to stop its service in 2016 due to competition on more mainline routes, from larger companies who will not tend to remote-rural villages, as Mr Hurst's bus company had[42].

Rothbury is equipped with a police and fire station however in 2016 there was a controversial closure of the Rothbury Community Hospital healthcare facility which closed in September 2016 which now forces individuals to travel to Alnwick, Wooler, Berwick-Upon-Tweed or one of a number of hospitals in Newcastle-Upon-Tyne. Interestingly however, Rothbury was first to acquire superfast broadband in 2013 (*Full speed ahead!*, 2013), as

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[41] https://www.chroniclelive.co.uk/news/north-east-news/rothbury-bus-driver-steve-hurst-8412649
[42] https://www.theguardian.com/uk-news/2016/oct/21/anger-as-northumberland-rural-bus-service-shuts-while-big-players-prosper

opposed to Wooler that acquired it in 2014 (*iNorthumberland*, 2014). However, other smaller villages to the west of Rothbury such as Thropton, Caistron, Sharperton and Harbottle, are yet to benefit from such infrastructure upgrades due to a lack of provision planned for these even more remote locations.
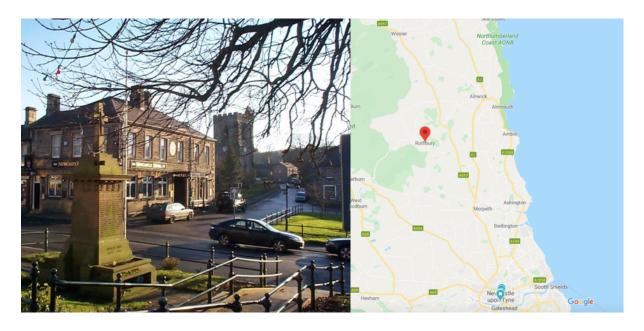
Figure 12 Rothbury: Location in central Northumberland located 20 miles south of Wooler

3.7.5) Act. Design and deployment of Showboater

Following the establishment of new requirements for the display network software the design of a new system could begin. As before with the first action research cycle and the development of GleNet, the design followed a similar agile methodology (see section 3.7.2). However, due to the newly defined requirements there was less emphasis on the display clients with more attention focused on the content management system which delivered content. Development was relatively quick due to having prior knowledge of how GleNet functioned so many of the basic operations expected of a distributed display system were fully understood relative to the rural context for which they would be applied. In certain aspects, the new requirements for the new system had been simplified which made the development process even more streamlined. The new display system was created in collaboration with another colleague from the department (*D1*) and upon completion was dubbed 'Showboater'.

The plan moving forward was to firstly deploy the newly developed Showboater in the town of Rothbury and then, once the system had been tested in-situ, replace the existing GleNet platform in Glendale, offering it as an upgraded system. The rationale for deploying in Rothbury first and then Glendale came down to the relationships that had been built with stakeholders. I felt by offering Rothbury the Showboater system first that this would help develop relations with *R1* and *R2*, knowing that they now understood the drawbacks of the original GleNet system and had raised expectations of how the system would operate. Stakeholders *G1* and *G2*, as well as numerous hosts of display clients in Glendale, had already dedicated much of their time to GleNet and as such it felt unfair to use them for the purposes of testing yet again.

The deployment of Showboater began in Rothbury in January 2017. The approach taken for this deployment applied many of the lessons learnt from the GleNet deployment as well as what had been learnt from literature since its deployment. More emphasis was placed on preparing the community for the system's arrival. For example, a school competition was run to determine the name of the network before it had been installed; Rothbury's display system was soon officially named 'CoNet'. Other community activities took place throughout the months on the build up to its official launch on the 14th July 2017 at the annual Rothbury Music Festival[43]. In Glendale, the GleNet system was eventually decommissioned in late 2017 and replace with a now fully tested Showboater platform which retained the same GleNet name as it had previously.

3.7.6) Reflect. Evaluation of Showboater

In early 2018, a full evaluation and reflection of the Showboater platform and its respective deployments in both Rothbury (CoNet) and Glendale (GleNet) took place. Across both

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[43] https://www.rothburymusicfestival.co.uk/

deployment sites the evaluations consisted of field observational notes, one-to-one, semi-structured interviews (Sayrs, 1998) with three stakeholders and six display client hosts. Questions were formulated using field observations which primarily focused on issues of ownership, access and governance, perceived value, impact, branding, content whilst taking into consideration the general affordances of the system and its functionality. All interviews were audio recorded and transcribed. A total of 19 hours of interview data were recorded across the evaluation period however only 11 were deemed relevant for the purposes of evaluation. All of the interviews conducted were transcribed and analysed using thematic analysis (Braun and Clarke, 2006, 2012). The process of thematic analysis allows written data to be coded inductively so that core themes can be generated. The themes generated through this process were then used to form a narrative which references back to the originally transcribed data and participant quotations. As the evaluation took place, I kept my own fieldnotes which made record of any smaller points of interest and helped to contextualise any information that became apparent during the interviews. GleNet's usage logs consisting of 158 pieces of newly uploaded content were taken into consideration as part of the evaluation process, as were 947 pieces of content that had accumulated on CoNet's platform.

3.8) Chapter summary

This chapter has presented an overview of the methods and approaches employed as part of the first and second cycle of action research which took place in Northumberland, North East of England. The deployment locations this case study focuses on is Wooler and the surrounding area (Glendale) and Rothbury. The work which corresponds to this PhD thesis is highlighted in action research cycle two which began with an analysis of the evaluation data as a result of the first action research cycle. In all this project has spanned six years and is still active to this present day in both rural Glendale and Rothbury locations. Across this time, I have utilised

ethnographic observations, interviews and questionnaires to collect data about the deployments and rural communities of the North East.

The strong working relationships that have been built as part of the work carried out in this chapter proved an integral part of the on-going longitudinal relationship I have with stakeholders and hosts from rural Northumberland; the high level of trust and dependability that I have built with stakeholders through adopting a pragmatic action research role have even allowed the networks to grow and continue to serve a purpose and role in each respective community.

4) Rural Displays: Design and Deployment

This chapter begins by providing a summary account of work completed prior to the PhD research beginning. The GleNet system was re-designed in 2016 following a year in deployment in Glendale. Several technical issues were identified with the hardware and software as part of the first iteration of GleNet which needed to be addressed if the system was going to provide a stable platform for moving forward. An evaluation of the display system took place which informed a number of design goals for a new system which was late implemented and nicknamed Showboater (Nicholson *et al.*, 2019). Showboater was then deployed in Glendale (technically GleNet v2) and in the new rural location of Rothbury. This chapter outlines how the system was further developed between late 2016 and early 2018 where it was re-designed and deployed, predominantly focusing on the planning, design and deployment of Showboater as part of the second action research cycle with a full evaluation and reflection on both GleNet and CoNet deployments detailed in chapter 5).

4.1) A Summary (GleNet)

This subsection reflects the design and deployment of GleNet which was carried out as part of the first action research cycle which took place between summer 2015 and summer 2016. The work in this subsection enabled the future work of the PhD to be completed.

4.1.1) Act. Technical overview (GleNet)
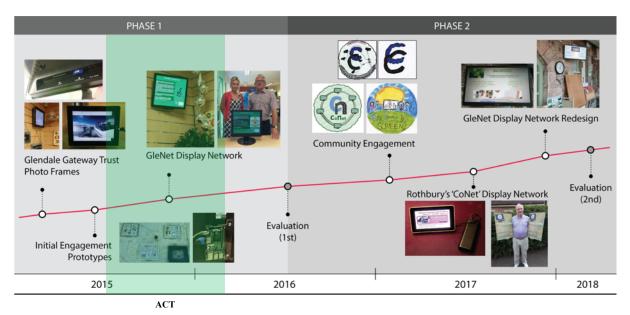
Figure 13 This stage of the case study is highlighted in green (Action Research 'act' stage)

The system outlined in Chapter 3) details the action research approach and methods used to establish GleNet[44], a system designed and implemented to meet the requirements of the Glendale Gateway Trust for the rural distribution of digital content for young people. The purpose of the display system is to provide a digital platform for communicating and dispersing digital information to help tackle prominent social exclusion issues affecting young people in Wooler and the surrounding area. When deployed in 2015, GleNet consisted of seven displays. Each 'display client' (Figure 14) consisted of a refurbished computer monitor and Raspberry Pi computer. The refurbished monitors were sourced from e-waste at Newcastle University to compensate for the small £500 budget that Glendale Gateway Trust had available to spend. It was also one way which promoted longer-term sustainability of the project at the time by using regular, off-the-shelf equipment.

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[44] http://ruralconnect.biz/pioneering-university-partnership-opens-gateway-to-reach-rural-communities.html

Figure 14 GleNet deployed in Lowick Village Store (top left, top right),

GleNet prototype (bottom left) & Raspberry Pi driving content on monitors (middle & bottom right)

The display system consists of two main components: The Content Management System (CMS) and Display Clients (Figure 15). The CMS provided a secure web interface for Glendale Gateway Trust members to log into. Once logged in, a member can choose which display client they would like to display information on. The system was configured so that each display client could be individually addressed so stakeholders could tailor content to different geographic areas or send content to all displays. The CMS provided 9 templated formats (Figure 16) for which information content could be entered into for display. The templates were constructed using simple Hypertext Markup Language (HTML) and took the form of webpages which were later populated with content using simplified Hypertext Markdown Language[45] (simplified HTML for ease of use and quick formatting). Once content had been inserted in a template, it was saved to a central database along with other parameters including time-on-screen, which displays it was going to go live on and if there were any restrictions on when the content needed to go live (schedule).

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[45] https://www.markdownguide.org/basic-syntax/

A display client includes both a monitor and Raspberry Pi microcomputer. The Raspberry Pi is a small, low powered Unix based computer which is responsible for syncing content in the form of completed HTML templates from the CMS and displaying it onto the monitor.
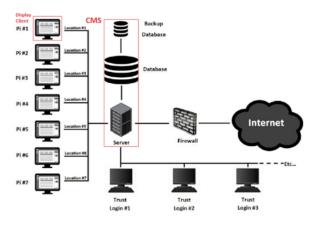
Figure 15 GleNet simplified system overview

To tackle inconsistencies in content formatting, GleNet adopted a templated approach to content whereby information was re-entered into pre-existing templates in 9 set formats.
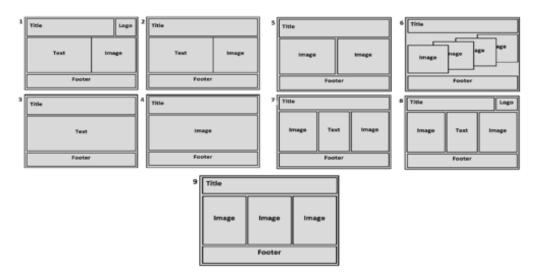
Figure 16 Templates available for GleNet content

These templates offered a variety of display options and configurations for text and images. Some templates offered text areas with scrolling text whilst others were static. Some allowed for associated pictures to be included whereas others would allow images to be displayed full screen. The colours of each template were normalised to reflect the colours adopted by

Glendale Gateway Trust's branding on their logo. The image below (Figure 17) represents a typical 'slide' that would be displayed on a display client after the content had been dropped into the template on the CMS.

Figure 17 An example of a published GleNet slide

4.1.2) Reflect. Technical evaluation (GleNet)
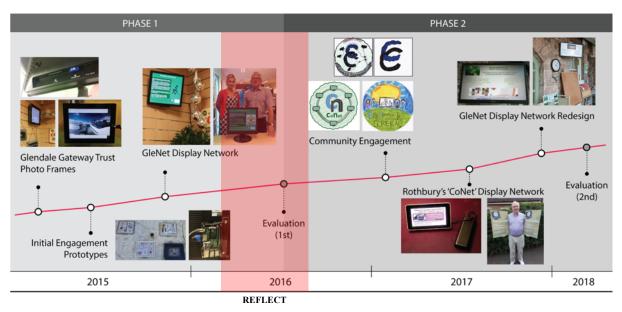
Figure 18 This stage of the case study is highlighted in red (Action Research 'reflect' stage)

Two separate evaluations were carried out on GleNet in 2016. The first evaluation consisted of my own technical evaluation focusing on the GleNet's functionality as a digital display network, the maintenance required and its general suitability for the application in rural

Northumberland. This evaluation was predominantly based on observational notes, my own ethnographic notes and the general time that I had spent maintaining GleNet since it's deployment in summer 2015.

4.1.2.1 Troubleshooting GleNet

GleNet's first year of deployment (2015 – 2016) was troublesome and this meant that it required frequent attention in order to maintain uptime and provide a consistent service to the community of Glendale. The problems were predominantly a combination of hardware faults and failures, as well as software bugs which stemmed from the rapid software implementation of GleNet during summer 2015. Any issues which were not isolated to the content management system of GleNet required me to schedule maintenance time to go and fix the problem which typically resulted in a lengthy drive to Wooler or surrounding deployment sites. The journey from Newcastle-Upon-Tyne to Wooler took approximately one hour each way and covered approximately 100 miles in a round trip (Figure 19).
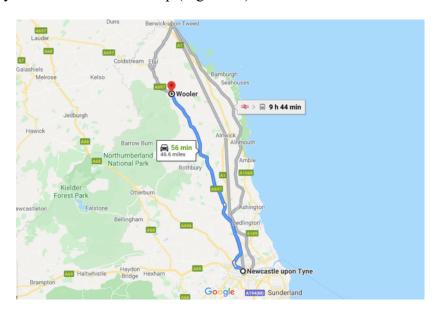
Figure 19 Newcastle Upon Tyne to Wooler, Northumberland

Below, Table 3 shows a categorisation and description of issues that were logged over the course of GleNet's first year of deployment between 1st September 2015 and 31stAugust 2016:

Problem Categorisation	Date occurred	Description
Hardware	15.09.2015	Wi-Fi dongle replacement – faulty.
Hardware	17.09.2015	Raspberry Pi power adapter faulty.
Software	21.09.2015	Raspberry Pi scripts not pulling from local content folder.
Software	03.10.2015	Epiphany web-browser would not re-start or load content.
Software (CMS)	27.10.2015	Selecting template no. 6 or 8 caused JavaScript error on CMS.
Software	07.11.2015	Epiphany web-browser would not re-start or load content. Display deployed in Glendale Middle School lost Wi-Fi credentials.
Hardware	14.12.2015	Wi-Fi dongle replacement – faulty.
Hardware	22.01.2016	Raspberry Pi power adapter faulty.
Software	05.02.2016	
Software	06.02.2016	All Pi's updated manually via terminal input, on site.
Software	07.02.2016	
Hardware	03.03.2016	Monitor failure.
Software	26.04.2016	Raspberry Pi scripts not pulling from local content folder.
Software	22.05.2016	Corruption of SD card content.
Hardware	02.06.2016	Monitor failure.
Hardware	03.06.2016	Raspberry Pi failure – no output signal.
Software	13.08.2016	Epiphany web-browser would not re-start or load content.

Table 3: GleNet Problem Log 2014-2015

In total, 17 journeys were recorded between 2015 and 2016, not including additional journeys to help stakeholder *G1* or *G2* launch new display nodes.

4.1.2.2 Hardware and software

There were a number of hardware failures throughout the first year of deployment for GleNet. The most reoccurring problem was the consistent failure of USB powered Wi-Fi adapters which would outright fail at seemingly random intervals, despite being bought new. Securing appropriate power adapters for the Raspberry Pi's was challenging as many 'official' power supplies resulted in the Raspberry Pi displaying the power warning icon on the screen. Whilst not an issues in itself, it caused a lot of unnecessary communication from worries hosts who would get in contact to check or ask me to make the journey to come and examine the display client. Towards the end of GleNet's first year of deployment in April 2016, some refurbished monitors began fail. This was not unexpected as they were originally scheduled for electronics

recycling (e-waste) at the beginning of the deployment, so it was surprising they remained in a functioning state as long as they had.

The scripts running on the Raspberry Pi were not complex however they would sometimes prove difficult to initiate automatically from the Pi's script scheduler. Most of the issues that occurred on the display client itself could be overcome by restarting the Raspberry Pi. On occasions, scripts would glitch and fail to pull content from the content management server which did require me to visit displays individually to manually clear content log files. The major disadvantage of GleNet was that there was no remote monitoring or access build into the software implementation; I had no provision to remotely maintain each display client. Furthermore, the web browser 'Epiphany' which was used in kiosk mode to display HTML templates was at best described as unstable and would frequently crash. A combination of scripts were in place to monitor the browser and overcome crashes, however on occasions the scripts could not recover the Raspberry Pi microcomputer and an error message would be placed on the screen requiring a hard-reset and clearing of script log files. Setting up new display clients was too difficult for anyone without experience of GleNet's architecture as it meant reconfiguring individual parameters across multiple scripts on the display client, as well as manually altering background scripts on the content management server. The general perceived usability of GleNet's content management system was poor as it required that users firstly learn how to use HTML Markdown[46] to be able to enter content into existing templates in a visually appealing way. There was no preview available of the slide before it was published until it became visible on the screen. Lists of slides that had been published were not easily accessible or visible on the content management server and it was difficult to understand which display locations had received newly published content.

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[46] https://www.markdownguide.org/basic-syntax/

4.1.3) Reflect. User evaluation
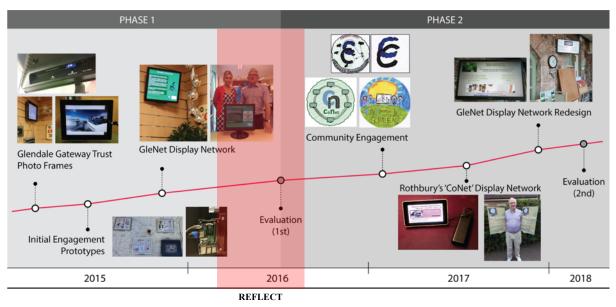
Figure 20 This stage of the case study is highlighted in red (still in the Action Research 'reflect' stage)

A user evaluation was conducted on GleNet which aimed to understand what the system was like to use from a stakeholder perspective, as well as how useful it was perceived to be for Wooler and the surrounding area. To do this, an evaluation was conducted which consisted of semi-structured one-to-one audio recorded interviews were used to approach stakeholders, display hosts and young people (for more information about methodology and data collection, see chapter 3.6). Sections 4.1.3.1 to 4.1.3.5 highlight the themes which emerged as a result of the interviews being thematically analysed.

4.1.3.1 Impact assessment

Glendale Gateway Trust had found it difficult to evaluate the impact of the GleNet displays, especially when it came to measuring the extent of the initiatives success. A trustee of the Trust commented: *"It has been difficult to quantify the success of the project due to the rural location of monitors and the isolated nature of the project" (T1).* The challenges of inaccessibility and rural disparity have impacted upon the capability of stakeholders to conduct their own evaluations. Over the course of the week-long evaluation, it became evident that some attempt had been made by the Trust to evaluate the displays themselves by asking local groups and organizations

to comment on how they perceived the displays and the content which was in circulation on the displays. The Trust collected and used feedback towards the Big Lottery grant application as their own evaluation of the money that was originally spent on the displays. Some of these comments highlighted that: *'We've seen an increase in membership over the last 6 months in particular …we don't have any firm figures regarding how our newest members have come to join us, as the screens have formed part of a wide marketing and recruitment campaign. I've found in general that spreading publicity over several mediums has helped us enormously and I feel the screens have helped us reach out across communities.' (H3).*

Despite the Trust having limited means of quantifying the success of the displays, they still considered the displays as being a successful tool for distributing information digitally: *"Despite a lack of evidence to support the general notion that the project has been a success, the project has been well received by the community - who regularly send information to me to promote. We currently have over 20 separate adverts." (G2).* Word of mouth feedback was a useful way in which GGT was able to evaluate the displays: *"I feel as if there's been positive reaction to them, so through word-of-mouth people are very positive about it." (G1).* There was a notion that the displays were intrinsically accepted as 'a good initiative' for the benefit of young people.

4.1.3.2 Perceived usefulness for youth

The Trust had outlined that it would be useful to know how many people (particularly young people) had attended or even joined new clubs or got involved in new activities as a result of reading on-screen content promoting local clubs and opportunities. One young person commented within an interview: *"Well the one I looked at, which actually got me going, was the gliding. Gliding Club…I'm actually in the Gliding Club now so it's actually quite useful." (Youth).* Similarly, another young person commented within a separate interview: *"I've seen something about swimming which I actually went for…I followed that up, it was really good*

actually. I got most of the information off [the display], like the day and time to go, of which I did just go down, so it was pretty much everything I needed." (Youth). Another young person recollected that one of his friends had seen content on the display and had successfully followed it through to secure a job: *"Those lads who actually found an apprenticeship off, of that screen now work down at [a company]." (Youth).* One further young person stated that they followed up on some information displayed on the screen: *"There was one as well, boxing…I spoke to a bloke about that" (Youth).*

Of course, not all young people, hosts or members of the general public had actively followed up on information they had read as a result of the displays. One young person noted that young people were more likely to enquire about a particular activity but "*they would rarely follow up on any of it*" (*Youth*). Asking further questions about why information was not always followed up, youth participants responded by highlighting the broader issues surrounding travel and cost in the area that many opportunities are out of range, both financially and geographically. This reinforces the notion that using digital displays is by no means a solution to problems surrounding social inclusion. Digital displays are merely a tool which the Trust believed would be easy to adapt in order to allow greater awareness of potential solutions; the solutions being the local initiatives, clubs and activities which have the effect of drawing youth back into community initiatives. However, from young people's feedback, it seems as if the opportunities that were advertised were not as localised as they could have been, therefore not overcoming any of the original issues surrounding accessibility.

4.1.3.3 Perceived usefulness for others

The general consensus of people who were approached as part of the evaluation perceived the display as being a useful source of general information. In particular, young people had expressed that content had been helpful as it provided them with an understanding of the events, initiatives and activities that were currently being advertised in the local area, despite some of

them being too far away to get to. Hosts of display clients were equally positive: *"[The] Majority of them do [read the display] when they come in, yes, they look at it. They don't always read it to start with but, yes, they do look, they do look at it and see what's on." (H4)*. One host pointed out the usefulness of GleNet for local tourism and another other young people from outside the local area who attend the Drop-In Centre during the summer holiday season stated: *"Yes [it was useful], because it showed you obviously what's going on here and stuff, so it could help you if you're just new here and then want to know what goes on." (H5)*. Some hosts also believed the displays would be a good way of complemented their everyday routine by allowing them to check details relating to their regular routine: *"Even I check because I've got a younger child I look after and it's like the Cubs, we forget what time they're on, so it's got times [to remind us]." (H6)*. Another host commented: *"There's one or two things that have popped up that we've thought, 'We should go to that' or 'we'll do that'. If it's been a fair or it's been the [local] Festival. You know, it was advertised on there." (H3)*.

The number of people who had followed up on display content could not be quantified however audio interviews helped to capture personal accounts of those who had. One host summarized the difficulty in quantifying how many young people engage with the content: *"...but young ones often look at things and don't say, 'Oh, I've just looked at that' without telling you, so you wouldn't know unless they, you know, [they] looked at it." (H5)*. Given the simplistic nature of GleNet's implementation, the ability to capture glances or monitor read time is far beyond the capabilities or scope of the system but it is also a difficult aspect to capture as Dalton, et al. (2015) discovered.

However, other members of the general public and hosts perceived GleNet's content to be too heavily pitched towards younger people. Some expressed their frustration at this stating that the content was not inclusive of their own interests. Similarly, they acknowledged that the content could also be useful for parents of the young people: *"No I think it's a spread but each*

one is, you know, like the scouts for the kids. Or, parents, it goes both ways." (H2). Others simply did not think the content was relevant to them in any way: *"The information is of no interest to me, so I don't look at them." (H5)*. The displays seemed to have fulfilled their purpose of engaging young people but consequently, due to the nature of the content being display on the public display network, it seemed to also exclude other older demographics within the community. When asking about the exclusion of older people, one member of GGT commented: *"I propose we extend the offer and remove the age restriction to appeal to the entire community of [the area]." (T2)*. GGT acknowledged the displays had limited content however with the Big Lottery funding coming to an end the displays could be used more generically to disperse new forms of digital content.

4.1.3.4   Interactivity and content concerns

As the core user group of GleNet, the Trust staff (*G1* and *G2*) and trustees of the Trust were asked to comment on what aspects of the displays they would like to see improved in future iterations: *"I would make them more interactive so that it holds the users, or the browsers' attention a bit more." (T1)*. The same GGT staff member later commented that it would become *"more of a focal point for the community"(T1)* if there was a way to directly interact with the displays themselves. GGT would like to see the displays being used more as an information point, drawing similarities with how the interactive kiosks at tourist information offices work. A trustee member highlighted within a separate interview: *"...the whole rationale about people being able to select the information they want would be very valuable." (T2)*. There was a strong desire for the displays to incorporate some means of selecting content or different streams of information instead of content *"just going around on a loop"* (*T1*).

We approached hosts and youth to pose the same question and their responses echoed around similar ideas: *"I'd do interactive, definitely interactive, so touch screen. Still on the screen, but maybe putting it into categories of what's on." (Youth)*. A host responded by stating

that GleNet should incorporate *"Drop-down menus and stuff so you can… You know if you want to find out something, if that's showing you with the touch screen for more information possibly?" (Youth)*. There is a perceived importance regarding the separation of content and how relevant content can be searched for more efficiently. Both suggestions of increased interactivity (through physical buttons or touch screen functionality) and content categorisation highlight a desire for searchable content. However, one trustee highlighted their worries towards the implications of increasing searchable content on the displays, if this were to be implemented: *"I think the dilemma for us is, if we cram this all into one lot of screens, then this could be diluting the information." (T2)*. Evidently, there is a balance to strike between how content is categorised and how features that allow people to search for content are implemented. Given that the primary purpose of GleNet was to spread general information about new opportunities in the local area for youth, the transformation of individual displays into information kiosks with search facilities could prove detrimental to the primary purpose of what GleNet was set up to do.

4.1.3.5 Summary

The initial evaluation of the GleNet highlighted a number of aspects about the display network including how it was positively received by the community. This user evaluation and the technical evaluation gave way to the formation of new concrete requirements for a second action research cycle. The deployment of GleNet reinforced the subtle importance of the role which GleNet played in the community of Glendale, particularly for the small collection of young people in Wooler. Despite GleNet's documented problems, it demonstrated that it was a worthwhile research project and worthy of a re-design to better meet the expectations and changing needs of the community. Next, I provide information about how my experiences and evaluation of GleNet helped formulate new design goals for creating the next iteration of a networked digital display platform.

4.2) Plan. Establishing design goals
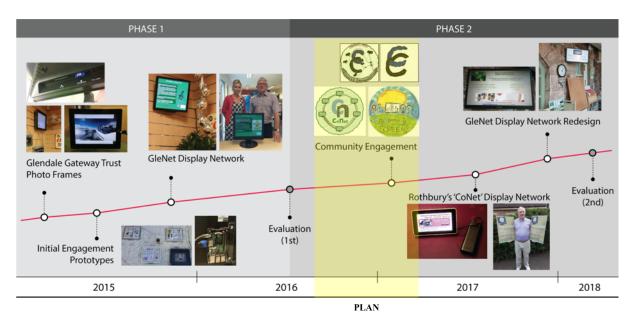
Figure 21 This stage of the case study is highlighted in yellow (Action Research 'plan' stage)

Following on from the evaluation of GleNet, I set out to re-analyse the data so that new design requirements could be created. This subsection marks the beginning of work completed as part of the PhD in September 2016. I explain each Design Goal (DG) and clarify how it addresses points raised from the evaluation data or other problems experienced during GleNet's deployment. In total, five broad design goals (Nicholson *et al.*, 2019) were established which underpin the architectural design decisions behind Showboater (see section 4.3)) as a digital display platform for rural digital signage.

4.2.1) DG1: functional

The display network requires a content management system to allow people to add, edit, remove and schedule content, as well as perform administrative tasks such as adding and removing addressable display clients and users from the network. In the first iteration of GleNet's content management system, the action of adding and editing content inside pre-designed templates proved troublesome for the Trust's staff due to it requiring them to learn and become proficient with HTML Markdown coding, which caused further delays in the publishing process. Furthermore, content templates, especially templates with scrolling text,

were too fiddly and restrictive to fill in. The task of adding and removing display clients from the network required manual database entry on the content management system which inevitably caused further delays as this was only actionable by the author.

Display nodes should display and rotate through a collection of content. In the evaluation it became clear that people wanted to have more interactivity in the form of touch screens or buttons to manually cycle content on each display however this was not implemented as it was seen to have implications on the long-term maintainability and general sustainability of the display network. Furthermore, several displays were VESA[47] mounted to walls in positions that were not immediately accessible for a touch screen interface.

4.2.2) DG2: sustainable

There were clear budget limitations when GleNet was first designed and deployed. Given these financial constraints and considering how other rural communities may be in a similar situation, financial sustainability was one of our primary design objectives. Furthermore, designing a display network that could exist as a longstanding community asset which is not burdensome to use, administer, expand and manage was also of high importance to sustain community uptake and engagement. The cost of the networked public display required had to be carefully considered so that it would be feasible to allow for maintainability to preserve the longevity of the network, especially once the display network was handed over to the community.

4.2.3) DG3: scalable

As well as being sustainable, the display network had to easily scale up or down to reflect the needs of the community. For example, the presence of a business or organization who have opted to host a display client could be transient, resulting in a need to relocate or reposition the

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[47] https://www.oneforall.co.uk/explore/vesa-mounting-standard#/step-1

display client. For the initial year of GleNet's deployment, display clients were only redistributable by the author due to the technical requirements of manually changing database entries into the content management system and altering script files on the display client itself. Similarly, by allowing the network to adapt to the community's needs, there were implications for how the network of displays was implemented to allow for scalability to occur across a range of different computing devices, rather than restricting it to a single or small group of devices. Previously, GleNet was only configured to operate on a Raspberry Pi microcomputer due to custom scripts running in the background. The new aim was to be able to run the display client from any operating system, instead of restricting it to the enthusiasts 'Raspbian' OS.

4.2.4) DG4: resilient

One of our original aims was to design a display system which was flexible enough to leverage both LAN and cellular network connections, depending on connectivity availability, as the coverage of both of these is limited in Northumberland. Given the frequent dropouts and disruptions to internet services in the area, we quickly realized the need to locally store a copy of content on each node to ensure there was always some content to display. In conducting our study inside such a large and remote geographical area of England, we wanted to allow for complete remote accessibility of each display node for the purposes of monitoring, updating software and timely troubleshooting. One large reason for this is due to the amount of time the author spent travelling between Newcastle-Upon-Tyne and Northumberland to either fix, relocate or change settings for the display network which was a great deal of effort. Common problems that needed attending to include the lagging of the display client's web browser due to an excess build-up of log files and frequent crashing and unresponsiveness caused by these files. Some screens used for GleNet that were originally sourced for free and refurbished for the project were starting to fail as well as the model of Raspberry Pi being used now outdated with newer versions with increased capacity and processing power available on the market.

4.2.5) DG5: distributed governance

The display network is intended to be a community resource, which affords shared responsibility and distribution of labour for all stakeholders. These include administrators, content creators and moderators, hosts of display clients, as well as the general public. By sharing access and responsibility, our aim is to promote participation, but also introduce redundancy and allow for communal governance. The server architecture will afford the tools necessary for the distribution of administrative roles, such as content creation and moderation as well as the ability to direct content. By directing localized content to different areas of the network, we can better accommodate the diverse range of stakeholders and rural communities.

4.3) Act. Designing Showboater

Following an agile software design methodology, as outlined in section 3.3), the new software architecture was pieced together following the five design goals. The display network architecture was dubbed 'Showboater' and utilised an internet-based client-server model (Figure 22). The system consists of a central database accessed through a web-based Display Network Server API; web-based user interfaces for the screen display client; and a CMS for stakeholders to manage the content and display provisioning.
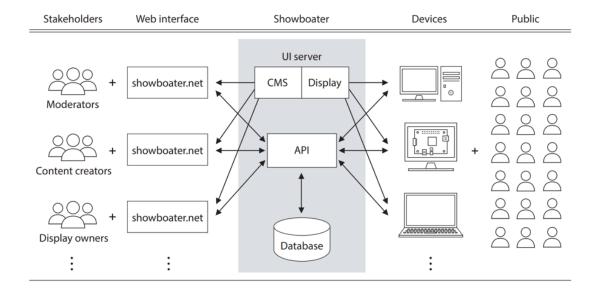
Figure 22 Overview of Showboater architecture

4.3.1) Display network server

The Display Network Server provides a remote Application Programmer's Interface (API) for mediating machine-to-machine access to the database. The API is web-based (working over HTTP), allowing it to be directly accessed from the content management system and Display web clients.

4.3.2) Entities

The principal entities of the system are: User, Display, Deployment and Media. A User represents a stakeholder (of any type), their email address as a unique account identity, their name and an avatar image. A Display represents a public display screen with its own description and owner (user). A Deployment represents an intentional grouping of display media (and, indirectly, the moderators involved and displays on which they will be shown) and whether the deployment is currently active and/or open to public submission. Finally, Media, represents slide content intended to be shown on a display as part of a deployment: it has an owner (user), moderated status, and optional start and end date/times for its display. Additional entities are used to model many-to-many relationships: Presentation for assigning one or more deployments to be shown on a display; and Permission to allow one or more users to be content moderators for a deployment.

4.3.3) Permissions

The permissions of the system are rich enough to support the interests of the many types of stakeholders: content creators (who want to be able to provide new content); display hosts (who want control over what is shown on their display); deployment moderators (who can judge whether media is accepted to a deployment); deployment coordinator/owner (who can choose moderators and decide on public submission policy); and administrators (who can decide who

to trust to control content that is published on their system). The permissions were summarized as follows:

- **Display Owner:** Control which deployments a display will show the media from.

- **Deployment Moderator:** Review and then publish or reject media submitted for a deployment.

- **Deployment Coordinator:** Add or remove the moderator rights of users for the deployment.

- **Deployment Owner:** Control whether a deployment is currently active and/or is open for public submissions (otherwise, moderator-only submissions).

- **Administrator:** Make deployments 'active' (publicly viewable).

- **Super Administrator:** Add or remove Administrator permission for users.

4.3.4) Operations

The API facilitates a wide range of operations, each permissions-checked for the user, examples include:

- **User:** Creating new users. Logging in/out. Granting/removing permissions.

- **Media:** Adding new slides for a given deployment.

- **Display:** Creating/editing/listing displays. Listing and editing the deployments shown (presentations). List published media for presentations on a display.

- **Deployment:** Creating deployments. Adjusting permissions for a deployment. Listing/moderating media for a deployment.

4.3.5) Content management system

A web-based content management system acts as the user interface over the machine-to-machine API. The user flow follows familiar web site interactions: log in and creating a new account if necessary (Figure 23), view/add/update content (Figure 24) and log out.

A user can manage any displays they own (Figure 25) (adjusting which deployments are included on their display) and add new media to deployments accepting public submissions (or private deployments, if they are a moderator).
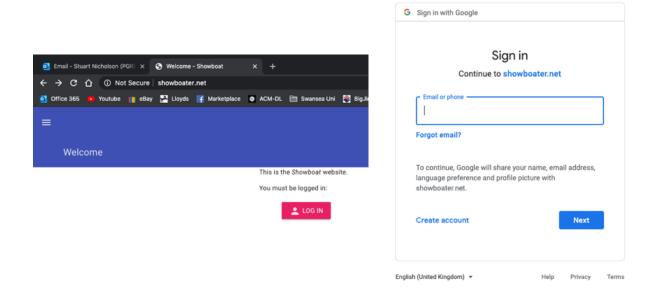
Figure 23 Logging in via Showboater UI (left) & Logging in via Google OAuth Service (right)
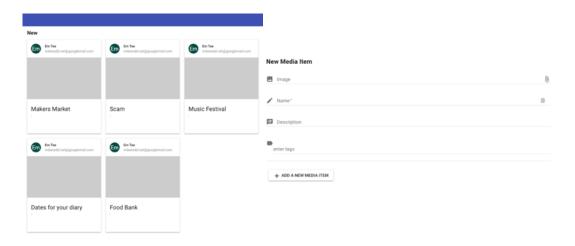
Figure 24 View live slides (slide content blanked due to permission restrictions) & add new media (right)

Media is accepted from a range of common formats, typically preferring losslessly-compressed `PNG' images exported from a presentation slide or image editor. For deployments in which they are the owner, users can adjust various deployment permissions. For deployments they are a moderator of, users can see and moderate submitted media, including making adjustments for the displayed date/times of the media.
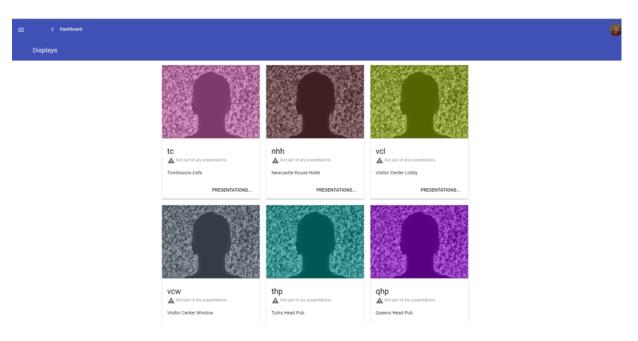
Figure 25 Showboater display management interface

4.3.6) Display client

Showboater's display client implementation is purposefully designed to require only a web-browser for content playback. This flexible approach allows use with a very large range of hardware. The client is simply accessed through a web address (URL[48]) which includes the unique identifier of the display. The page makes use of a widely supported feature (a Web App Manifest[49]) that ensures the client is cached: it is stored so that it can be used in the future, even if connectivity is temporarily unavailable. The player periodically asks the API for any changes to the media the display should be showing. This request is heavily optimized so that a very

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[48] https://www.verisign.com/en_US/website-presence/online/what-is-a-url/index.xhtml
[49] https://developer.mozilla.org/en-US/docs/Web/Manifest

small amount of data is used in the common case of no changes being made minimizing the overhead of adding a display to a network, and making it suitable for applications where data usage caps are present (such as mobile internet contracts). If there is a change to the content, the display client removes any expired content and downloads new media to a persistent storage (Indexed Database) under the full control of the page. This arrangement ensures the content presentation can continue uninterrupted in the face of network outages and/or a full restart of the display client. The display client continually cycles through the stored media as a slide carousel.

4.3.7) Display hardware

Showboater's display client is flexible enough to be deployed on any devices that can run a full-screen web browser. For example, any PC or laptop running Windows, macOS or Linux; or any tablet or mobile device running iOS or Android, would be compatible as a display node (Figure 26).

Figure 26 Showboater operating on a Raspberry Pi, Windows based desktop and Macintosh laptop

Throughout our deployments, we opted to primarily use Raspberry Pi's given their low price and availability; they are widely supported and highly customizable with online communities offering a plethora of guides, manuals and wikis that give insight into DIY cases, mounting brackets and accessories for the Pi. Later models, such as the Raspberry Pi 3 and Pi Zero W, support Wi-Fi connectivity internally, and the free Raspbian operating system gracefully handles Wi-Fi disconnections and reconnections in the background. The Pi also offers both HDMI and composite video output and can be connected to digital monitors and virtually any television set.

Display nodes which are using Pi's are additionally configured using a series of scripts which operate when the devices are powered. The scripts configure the Pi to blank the screen during the boot-up process, allowing time for the device to fetch new content from the server, and ensure the browser launches successfully in full-screen ('kiosk') mode.

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4.4) Act. Deploying Showboater
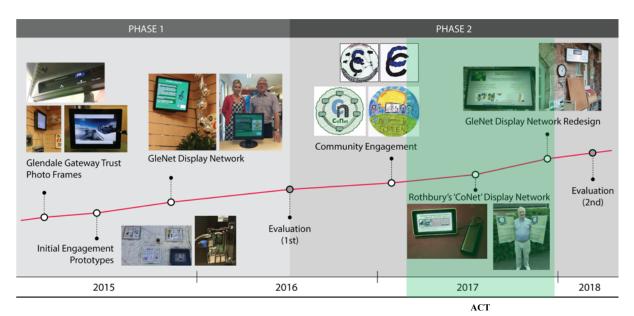
Figure 27 This stage of the case study is highlighted in green (Action Research 'act' stage)

Rothbury's 'CoNet' display network was launched on the days leading up to the 17th July 2017, in time for the annual Rothbury Music festival and at this point in time consisted of six individual display clients. In contrast to GleNet's deployment in 2015, I took a different approach with *R1* and *R2* leading up to its deployment; steps were taken to try and better introduce and integrate the display network into Rothbury's community. In the following subsections I outline the activities that took place leading up to CoNet's deployment and its deployment and subsequent launch.

4.4.1) Researcher and stakeholder approach

The approach taken for the deployment of Rothbury's CoNet was a little different from that of GleNet in summer 2015. I had learnt a lot from the GleNet deployment as well as from conversations I had with *R1* and *R2* about how they thought it would be best to approach Rothbury's community with the idea of a display network. When GleNet was first deployed it required a high amount of effort on my behalf to firstly understand the context in which it was being used and deployed and secondly, to understand how the system would perform under real world conditions. The longitudinal deployment of GleNet allowed me to familiarise myself

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with the networked displays and how it was used and managed in a rural community. The time and effort devoted towards the initialisation of GleNet as a system, as well as the planning and logistics surrounding its maintenance were considered high. I had worked closely with stakeholders (*G1, G2 and hosts*) during the GleNet deployment, typically carrying out the majority of the maintenance and upkeep tasks which in hindsight could have been delegated to more localised stakeholders, community members or display client hosts. For example, some tasks I completed included: resetting display client (turn off/on), installing new display client, upgrading display client screens and resetting display client Wi-Fi credentials. We (*R1, R2 and I*) were confident that by creating a public community awareness of the display network in Rothbury prior to its deployment, we could attract other stakeholders who could assist (with guidance) with some of the more routine tasks that I had previously completed for GleNet.

Rothbury's display network establishment and deployment were conducted in less time intensive manor whereby the majority of tasks and exercises associated with the setup and running of the network were devolved to different stakeholders. Due to the greater technological sophistication of Showboater, the platform allowed me to spend less time checking, testing and maintaining code, freed up more of my time to correspond with stakeholders in Rothbury. Furthermore, unlike GleNet, the Rothbury display network did not have any budget constraints therefore, it was decided that we could further mitigate some of the other technological issues experienced when deploying GleNet; for example, new 24" widescreen monitors were purchased to minimise instances of hardware failure.

Much of the coordination and organisation surrounding the establishment of Rothbury's display network was devolved to *R1* and *R2* from the outset of the project. *R1* took far more initiative and led the idea generation for how the network should integrate with the community of Rothbury. With some consideration, a three-step introduction strategy for Rothbury's community set in motion.

4.4.2) Step 1: school logo and name design competition

The first stage outlined as part of the three-step approach was running a school competition to determine an appropriate logo and name for the display network. The school in Rothbury, Dr Tomlinson Middle School[50], is already a central hub for the town which hosts an array of community activities and events on an ongoing basis. The competition, designed by *R1*, was designed and released to students during a morning assembly in early January 2017. Prizes in the form of Amazon[51] vouchers (to the value of £20 pounds for 1st and £10 for 2nd and 3rd third place) were made available to the winner and runners up of the competition. The winning entry was decided by a panel which consisted of *R1, R2* and representatives from the school and local parish council. Below is an outline of the top three entries received (Figure 28). In total, 9 entries were received by the school.

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[50] http://drthomlinson.the3rivers.net/
[51] https://www.amazon.co.uk/Amazon-Gift-Voucher-Greeting-Card-Birthday-Christmas-Top-Up/b?ie=UTF8&node=1571304031

Figure 28 Top-right: third place. Top-left: second place. Bottom-middle: first place.

The winning logo (Figure 28) depicts a series of display nodes scattered around the letters 'CC' which illustrate the bridge where the Coquet river crosses through the town of Rothbury. The name 'Coquet Communication' is depicted as part of the logo however it was agreed by the panel that this name was perhaps a little too long. The Rothbury display network now had an identity and was subsequently given the name 'CoNet', with permission being granted from the student who originally created the logo. *R1* adapted the paper drawing into a digital logo with moderate alterations, as well as with the name change implemented (Figure 29). From this point on, the Rothbury display network will be referred to as CoNet. The next step was to raise awareness of CoNet with the wider community.
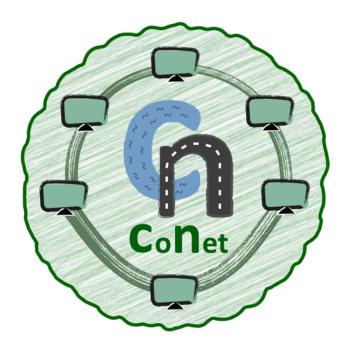
Figure 29 Final logo: CoNet

4.4.3) Step 2: marketing initiative

Over the Bridges[52] (OTB) is a community magazine organised and managed by the Churches Together group which serves the town of Rothbury and Upper Coquetdale. OTB is a free magazine which is distributed to all households in an online and paper-based format and is operated by a small team of editors and publishers who predominantly publish significant news, event details and small advertisements for local businesses. Upon the establishment of a name (CoNet) and corresponding logo for the display network, *R1* and *R2*, who were both already involved in running the editorial group which supports OTB, began to think about how they could introduce the display network to the wider community. They decided that the display network would be formally introduced by way of publicising it in the OTB magazine. CoNet received a 4-page spread which was used to introduce the concept, how the initiative started and how it was going be used as a community resource for Rothbury moving forward. The article also included information for how interested parties or persons could get in involved if

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[52] http://overthebridges.org/

they would like to either host a display or share informational content on the network, once it had gone live (Figure 30).

Figure 30 CoNet introductory Over The Bridges Article

4.4.4) Step 3: CoNet public launch

It was decided that CoNet would be launched on the 14th July 2017. Stakeholders had chosen this date because it fell on one of the most important weekends in Rothbury – the annual Traditional Music Festival (*Figure 31*), which typically saw thousands of people visit the town. The festival attracts thousands of musicians, tourists and business each year. The stakeholders had decided that deploying CoNet at this time would be of benefit to everyone to keep them informed about the music schedule and timings, as well as serving as an up-to-date source of information for music being performed at any precise moment in time during the festival and general updates. Rothbury Annual Traditional Music Festival

Figure 31 Rothbury Annual Traditional Music Festival

4.4.5) CoNet deployment locations

At the point at which CoNet was initially deployed during the Traditional Music Festival in July 2017, it consisted of six displays. The displays were situated in the following locations (Figure 32). These six initial locations included: The Turks Head, Newcastle House and The Queens public houses, Rothbury Tourist Information (two separate displays) and Tully's Café. Locations were chosen based on loose guidance put forward by *G2* (Glendale Stakeholder) who had been in contact with *R1* and *R2*. The public locations were accessible and already served as a community information point in some capacity. Similarly, these locations also had sympathetic hosts who were willing to absorb electricity costs and share broadband usage.
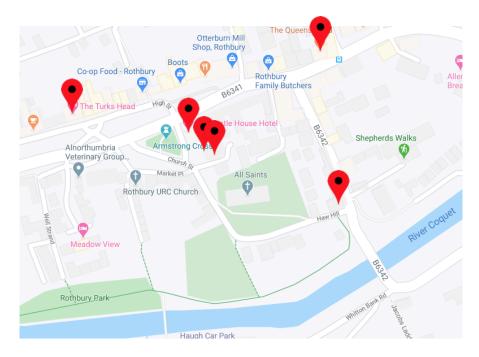
Figure 32 Rothbury Display Locations July 2017

After an initial period of three months, CoNet added two more display clients to its deployment footprint in and around Rothbury. Display clients which were originally located in Rothbury Tourist Information Centre were rehomed due to persistent complications with Wi-Fi access. The current deployment locations for CoNet are as follows; Collie Dog Computer Repairs, Jubilee Hall, Newcastle House, Turks Head and The Gate Public House, The Star Inn (Harbottle) and the Jubilee Hall. Additional nodes were installed by *R1* as the stakeholder who possessed the knowledge, tools and technical expertise to set up new display clients (Figure 33). Some other additional display clients have been installed by hosts who have the tools and expertise to do it themselves, in which case *R1* has assisted these hosts to set up the display client software by connecting it to Wi-Fi and establishing remote access software.

Display clients were monitored for the at least the next three months to ensure they were operating correctly and that *R1* (who had taken on the role of an administrator), was happy and felt supported. Trips were made back and from Newcastle Upon Tyne to Rothbury frequently to meet up with *R1* to discuss any on-going problems or issues they had. Once all the minor teething problems and troubleshooting had been overcome, my attention turned back

to the older GleNet system which was still deployed in Glendale. Knowing that the new Showboater platform now worked consistently and was considered stable, I began to re-deploy GleNet with the updated Showboater platform.

Figure 33 R1 installing a new node in the The Star Inn, Rothbury

4.5) GleNet deployment

Following the deployment of CoNet and an initial period of three months solving issues related to technical glitches and troubleshooting, the Showboater platform was considered stable enough to be re-deployed as part of the GleNet network in Glendale, Northumberland. A staggered re-deployment of GleNet took place from late 2017 to early 2018 and consisted of a simply replacing legacy GleNet display clients with new hardware in the form of updated Raspberry Pi's, widescreen monitors similar to those used in Rothbury's CoNet. In total, nine display clients were physically replaced as part of GleNet's transition to using the Showboater platform. The Showboater content management system was set up with display clients

configured prior to going out and replacing them to make it easier. Once in situ, each display client only needed to be given access to the internet and it was ready to go.

4.6) Chapter summary

This chapter has summarised the planning and acting segments of the second iteration of action research for PhD research conducted in rural Northumberland. Showboater was designed in accordance with five design goals which were established based on the evaluation of previous work completed in Glendale, Northumberland. The new platform, Showboater, was subsequently deployed in the neighbouring rural town of Rothbury, Northumberland where I worked in collaboration with local stakeholders to integrate and embed the display network. We did this in three steps; by running a school competition which asked students to think of a name and design a logo for the display network; corresponded with the local editorial group (OTB) to release a four-page spread informing the community of the initiative, its intentions and how other members of the community could get involved; deploying the network, now named CoNet, at a large public event in July 2017. After three months of CoNet being in place in Rothbury we were able to determine that the software and hardware was appropriately configured. GleNet, first deployed in summer 2015, was now an aging display system with out-of-date hardware and limited software functionality in comparison. Between late 2017 and early 2018, I updated all of GleNet's display network by replacing physical display clients and updating the content management system so that it could utilise the new Showboater architecture.

In the early months of 2018, GleNet and CoNet totalled 16 active display clients together which were all operating using the Showboater platform. in the following locations across Northumberland (Figure 34). In addition to CoNet and GleNet display network deployments a further deployment consisting of four display clients also launched in 2019 as

part of a small collaboration with Hospice Care Northumberland[53]. The CoNet and GleNet deployments continue to be used by their respective stakeholders and continue to operate in Northumberland.
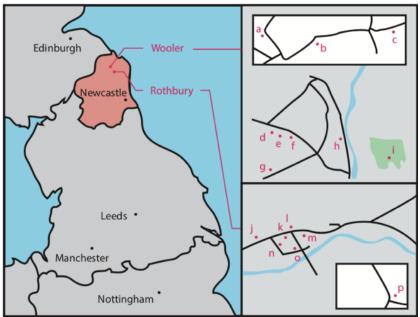
Figure 34 CoNet and GleNet active deployment locations - January 2018

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[53] https://www.hospicecare-nn.org.uk/

5) Rural Displays: Evaluation and Reflection
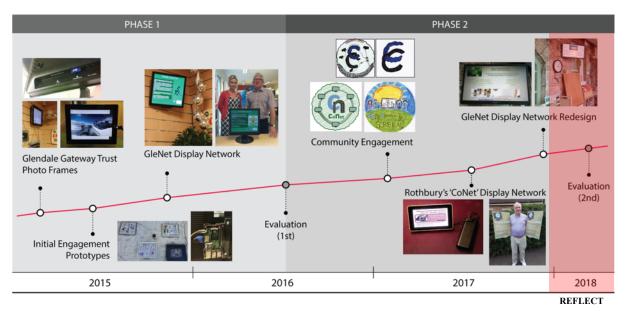
Figure 35 This stage of the case study is highlighted in red (Action Research 'reflect' stage).

As part of the final stage of action research carried out in Northumberland as part of this initial case study, a two-part evaluation took place. Firstly, I evaluated CoNet's deployment and GleNet's re-deployment experiences from my own perspective. As part of this evaluation, I begin by describing my own thoughts and perspective on the practicalities of the deployments, focusing most of my attention on CoNet as the new deployment location which offers more interesting insight than GleNet's re-deployment (replacement of old display system). Secondly, I amalgamate both CoNet's and GleNet's joint evaluation which surfaced from speaking directly with stakeholders and hosts so where I sought to understand their perception of each respective network, which including aspects such as management, ownership, control, visibility and content. Here, the findings are presented under three themes; 'Woolercentricity', 'Maintenance, administration and moderation' and 'Tensions over control'. Lastly, in light of these findings, I discuss considerations surrounding the development of governance and operational planning for rural community display networks. This is done by focusing on how the governance of the display networks and operational procedures were developed in the two

contexts for which these were deployed: on the one hand the research-led and `Wooler-centric' governance and operation of GleNet and on the other, the community-led and scalable CoNet. As the technologies that we used in both deployments for the display networks are the same, we bring our attention to the governance of such display networks and their content in rural communities and contribute considerations for their design, community appropriation and ownership.

5.1) CoNet: deployment realities

During the initial three months of CoNet's deployment it became apparent that there were a number of small issues occurring which were starting to impact on CoNet's uptime. For example, some hosts of display clients had got into a routine of switching the them (monitor and Raspberry Pi) off at night. This was not an issue in itself however *R1* noted how infrequently the nodes were actually online and available to receive new content over the network. Because the displays were new, hosts were not yet in the habit of turning them back on yet. In other deployment locations such as The Turks Head, the display client was being frequently powered off at the mains switch. This was because the mains socket was either used frequently to power other electrical items such as a hoover during after-hours clean-up or customers unplugging the display to charge their personal mobile devices. In Newcastle House there was an intermittent issue where the display client would be fully switched off during late hours of seemingly random days. *R1* noted that the issue was being caused by a local political figure who they knew, who was not a supporter of the CoNet initiative and its placement in Rothbury. This particular person had taken it upon themselves to actively turn off display clients in certain locations to try and jeopardise the initiative. *R1* noted that this person had a political standing within the community and was opposed to the initiative because it was categorically not an idea that was born from Rothbury, but instead an example of a large organisation (e.g. Newcastle University) imposing local influence.

5.1.1) CoNet: technical limitations

During the initial three-month deployment of CoNet there were a number of technical limitations which required immediate attention in order to maintain the uptime of CoNet. Firstly, the monitors which had been purchased for the deployment were newer by design and therefore incorporated energy saving profiles by default. The hidden 'eco' settings resulted in monitors switching themselves off automatically after only four hours of use. All monitors were manually configured to negate this feature however this had to be done in-situ. Secondly, the monitoring software used, named Dataplicity[54], used for remote management of individual display clients (Raspberry Pis) could only monitor the computers resources but was blind to the operating state of the monitor itself. That meant that although administrators, such as *R1*, could log in to Dataplicity to see which nodes were online, they had no real way of understanding if the monitor was switched on and displaying content to the public.

Since CoNet's launch at the Traditional Music Festival in Rothbury it became apparent that the web interface for Showboater was ineffective for bulk-uploading content. *R1*, who had volunteered to be the stakeholder who collated, formatted and uploaded content for CoNet openly criticised Showboater's scheduling capabilities as they found it tiresome attempting to upload and schedule large amounts of content in single instances. At this time, Showboater's web interface did not have an option for bulk scheduling operations which meant screen content had to be uploaded, scheduled and released individually – a feature Showboater still does not have to present.

5.1.2) CoNet: connectivity issues

Some display clients were experiencing intermittent Wi-Fi drop out caused by host organisations internet configurations. For example, The Rothbury Tourist Information Centre

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[54] https://www.dataplicity.com/

who originally hosted two display clients had Northumberland County Council configured internet which only allowed full-time access via port forwarding or through a network gateway. As the Raspberry Pi was unable to navigate the gateway and because the council would not allow the display on their network, the guest network had to be used. However, the guest network was time and speed restricted so the display client would only be able to stay online for a maximum time of 12 hours before it needed to be manually re-jointed to the network. This was a persistent problem for the two display clients at the Tourist Information Centre and it eventually resulted in the rehoming of them due to an inaccessible internet connection. Several alternative solutions were attempted including using a mobile data dongle however due to the buildings traditional structure with thick walls there was no accessible signal. This problem became apparent during the initial launch of CoNet where the Centre's screens would have to be manually re-connected to access the guest network in order to successfully connect to Showboater's distribution server to receive up-to-date information regarding the Traditional Music Festival's day to day running. Not too long after the troubleshooting and realisation that the displays were not going to work in this location the Tourist Information Centre was permanently closed in Rothbury.

5.2) CoNet: policies and code of conduct

R1 and *R2* had established a series of documents which provided detailed breakdowns on critical aspects of CoNet's longer term running and management (see appendix item 11.1). This document outlines policies, guidelines, roles, and responsibilities which relate to the:

- **Administration** – name of the network, owners, policy owners, administrators, editor responsibility, screen location responsibility, role of host-editors and sub-editors, and clarification of language in relation to display network e.g. a 'screen' refers to a display, it's mount and the computer and power supply.

- **Hardware** – how screens are distributed, funding of additional screens, physical installations and responsibilities of the host, insurance coverage for installations, electrical safety testing certification and testing intervals.

- **Host responsibilities** – allow sceen to have access to wifi and electricity, confidentiality of wifi passwords, operation for manually updating screens in the event of internet outage, moving a screen, abusing a screen and reporting technical problems.

- **Rules on content and advertising** – Minimum text size (legibility) and wordcount per slide, nature of information presentation (carousel), primary contact for slide requests, major event advertising rules, 'must carry' information list subscription for all screens, last-minute change request policy, logo and image size and clarity guidelines, procedure for advertising and payment for commercial advertising, slide approval and withdrawal procedure and slide layout and format.

- **General editorial principles** – prioritisation of slides, presence of political and/or opinions on slides, presence of profanity and vulgarity on slides, presence of flashing imagery, presence of 'scrolling text', maximum carousel length, etc.

The stakeholder group established such principles on the understanding that display clients would be in the public realm and should therefore have a set of robust codes of conduct to fall back upon. These documents would also serve as a role template for other people who found themselves to be in control of certain aspects of the network in the future.

The intention of the stakeholder group was to integrate CoNet's content creation with the local editorial group who produced articles for OTB monthly newsletter. The editorial principles set out a series of guidelines for how editors could compress their full-text newsletter articles into 'slides' for CoNet; specifically noting word count, time-on-screen, image rules and restrictions and layout.

5.3) CoNet: single administration and moderation

Following the initial launch of CoNet in Rothbury and the network's initial three months of running (albeit with some described teething issues), it became apparent that one stakeholder (*R1*) had become solely responsible for the running of CoNet. *R1* through the process of delegation and the skills they possessed and demonstrated, became the single person who was responsible for the day-to-day running of the network. *R2* no longer engaged with the displays project, but still remained an active community member in their other community activities and initiatives. *R1*'s role was now crucial to the following core tasks associated with the running of CoNet:

- **Administration & Governance** - The day-to-day running, organising and management of CoNet as a display network, inclusive of scheduling content for release to the network of active display clients. Due to responsibility dissolving to just one individual, this role required that *R1* be the singular point of contact for the entire running of CoNet. This also meant that *R1* was the single point of contact with me at the University when technical problems arose.

- **Content** – Creating content to meet the standards outlined within the CoNet policies; this includes sourcing the majority of content for the network.

- **Moderation** - The process of sorting through publicly submitted content which was sent to CoNet for presentation on the network. This process incurred *R1* time spent re-formatting content and ensuring guidelines and rules are adhered to.

In addition to the core responsibilities characterised by the day-to-day running of the network, *R1* has also strived to ensure the network develops further than a 'research project'. *R1's* aims were to embed the display network into the community of Rothbury and to be self-sufficient past the point at which support from the university is removed. For *R1*, this meant securing a financial foundation for the display network in order to ensure the network could

continue to grow and handle any future events; for example, buying a new Raspberry Pi or monitor. *R1* secured funding to the value of £200 pounds through a local grant for the purposes of maintaining CoNet.

In addition to securing funding, *R1* continues to promote the display network to local businesses and organisations that could potentially host nodes in public spaces in Rothbury and the Coquet valley. *R1* actively promotes CoNet at community events and public meetings in order to grow the network (Figure 36).

Figure 36 CoNet posters which were created by R1 (pictured) to promote CoNet at public events

In addition to posters and promotional material, *R1* also constructed a small portable CoNet display client consisting of a 9" TFT screen connected to a Raspberry Pi and battery bank which could be taken meetings and presentations in order to demonstrate CoNet's functionality. The portable display client operated by storing offline content which had been preloaded at the home of *R1* prior to demonstration.

5.4) CoNet usage and content

To date, CoNet has been heavily used as a platform for distributing community information. The display network has posted 947 individual slides which have all been formatted and scheduled by R1 as the sole administrator. In comparison to GleNet, CoNet has seen significantly more usage which, in comparison, has only been used to display 158 slides (using the Showboater architecture – ***not*** including content uploaded to the previous GleNet system). Content that have been uploaded to Showboater by *R1* have taken on a distinct formatting style which conforms to the editorial guidelines set out in the policy documentation set out in appendix item 11.1).

Figure 37 Rothbury's CoNet slides (sample) taken from online archive: https://digitalinteraction.github.io/showboater/

Policies were established by *R1* and *R2* during CoNet's early deployment. CoNet only displays a maximum of five slides at any one point during the carousel.

Slides which display on CoNet typically have a low amount of text which is readable at a rate of 2 words per second (one-minute total screen-time) and are formatted to only provide the bare necessary information. All slides are uploaded in the resolution of 1920x1080 so that

they match the native resolution of the display client's monitor. None of the slides contain flash imagery which could be considered distracting, nor are there any slides which convey political or opinionated content.

5.5) GleNet (re-)deployment

There is less to report on the re-deployment of GleNet due to the old system simply being replaced by the new Showboater platform. The re-deployment of GleNet went smoothly in comparison to the deployment of CoNet due to the problems already being identified and fixed. GleNet is administered by a single stakeholder (*G2*), and always has been, however now the Showboater platform affords more flexibility in how it can be managed. Despite this GleNet is still to this present time still under central control by G2 who operates it as part of their role at Glendale Gateway Trust. In total, nine display clients were replaced which included new Raspberry Pi microcomputers and new 24" widescreen monitors. I replaced and updated every individual display client for *G2* as there was no one identified as having the capacity to do it on their behalf. The display clients were updated over the courses of two months in late 2017, working around the commitments of hosts (typically café, shop and business owners) and fitting in appointments so that the updating could take place. The appointments would typically last two hours as this gave me time to remove old units, remove various bits of mounting hardware used and recycle it onto the new display client. There was not a great deal of configuration to do for GleNet's content management system, so a new deployment only needed to be setup on the Showboater platform and assigned to *G2*, who could then create instances of each display client on their network (nine displays).

5.6) GleNet: usage and content

Upon re-deployment of the updated GleNet system, *G2* initially had to recreate their content due to older content no longer being compatible with the new upload process that had been implemented on Showboater. Ultimately, the new upload process made it easier for *G2* who

has admitted they are less technically inclined that Rothbury's administrator (*R1*). Showboater has essentially adopted the process of uploading content that was present when the Trust was running Photo Displays (see section 3.7.1)); content can now be uploaded in an image format after it has been exported from an application, such as Microsoft PowerPoint. To date, GleNet has hosted 158 individual pieces of content. In comparison to CoNet, the formatting is inconsistent and the number of pieces of content displayed on the live carousel at any one time varies sporadically between 3 and 12 slides (Figure 38).

Figure 38 Glendale's GleNet slides (sample of uploaded content) taken from online archive: https://digitalinteraction.github.io/showboater/

Much of the content uploaded on GleNet is not optimised in the same way CoNet's content is. Many of the images vary in resolution which on the face of it, appears to take away from the identity of the display network. There are no policies, rules or guidelines surrounding the style or publishing requirements of content for GleNet and this is clearly reflected in the assortment of content visible on the network.

5.7) Evaluation of both GleNet and CoNet

Between late 2017 and early 2018 both GleNet and CoNet display networks were evaluated. Both evaluations consisted of one-to-one, semi-structured interviews with G1, *G2, R1, R2* and *T1*, as well as four hosts. Where possible, and in relation to the re-deployment of GleNet, I will reflect back on the initial deployment of GleNet as a point of comparison for the purposes of this evaluation. Over the course of the evaluation period, I collected predominantly qualitative data comprising of ethnographic observations, field notes and interviews across the evaluation period. Semi-structured interviews (Sayrs, 1998) were carried out with those directly involved with the deployments (*G2, R1*). Questions were formulated using field observations which primarily focused on issues of ownership, access and governance, perceived value, impact, branding, content, and took into account the general perceptions of the system and its functionality. A total of 19 hours of one-to-one interview data were recorded across the evaluation however it was decided that only 11 hours of data would be used for the purposes of analysis. A thematic approach (Braun and Clarke, 2006) was taken in analysing transcript data; the data was coded inductively and summarized with short codes, which were then grouped into larger candidate themes.

5.8) Evaluation findings

Here, the findings are presented under three themes; in 'Woolercentricity' I explain how different stakeholders perceived and articulated the benefits of the community displays as well as how these perceptions changed over time. In 'Maintenance, administration and moderation', I examine the challenges faced by the stakeholders to upkeep the network over the course of their deployment, and how each network was governed. Finally, in 'Tensions over control' I uncover how the community display networks were integrated in the daily practices and routines of the communities and stakeholders, as well as the social and emotional demands that they introduced.

5.8.1) GleNet's 'Woolercentricity'

The perception of the display networks shifted throughout the study timeline. They firstly generated excitement however their existence was eventually drawn into the landscape as a piece of silent ubiquitous technology where people started to view nodes as part of the scenery. Stakeholders and residents' perceptions of the benefits and utility of the display network also shifted and changed over the course of our deployments. For example, the Trust and its respective node hosts were initially excited about the installation of the display network as a novel and up to date piece of technology in Wooler with members of the community and stakeholders expressing positive ideas and anticipation towards the potential for the display network to generate benefits for the wider community. The Trust was initially pleased with the new and additional functionality it provided compared to their original digital photo frames initiative, despite the administrator spending significant time learning how to use the Showboater platform. Ultimately, the Trust found using the Showboater platform reduced the time needed to upload and distribute content and allowed the Trust to manage information more easily across the range of displays. In turn, the reduction in effort required to operate Showboater reduced the accumulation of incurred administrator expenses such as fuel for travelling to and from nodes as well as the reduced costs incurred from minimizing employee hour for node maintenance and upkeep. Showboater also saved me a great deal of time and effort as it required only a handful of maintenance visits to establish for each deployment area.

At the time of installation, the Trust recognized the displays' network to be a community resource built for the purpose of reaching out to young people to better inform them about local opportunities. This was surprising as the fact that neither the hosts of individual nodes, nor local residents, could upload content for themselves, they still perceived the displays to be a positive community resource that fulfilled the interests of the wider community. After

one year, the funding secured for addressing issues around social exclusion experienced by youth, had ended. As a requirement of the grant the trust was required to conduct an evaluation of the display network as well as assess its impact. While conducting a quantitative analysis of the uses of the network proved quite challenging for the Trust, anecdotal and qualitative data indicated a positive impact to community life in general. "*I feel as if there's been positive reaction to them, so through word-of-mouth people are very positive about it*" *(G2)*. Furthermore, it was noted by GGT trustees that because of the low-cost nature of the project, it could be "*written off*" as a "*fire and forget*" *(T1)* initiative which held intrinsically positive value for the community, whether it was utilized to its full potential or not.

From this point on, the Trust began to open up the variety of content that it was pushing onto the display network to appeal to a wider range of community groups. The display network was now perceived more as a community resource, which was useful to a different audience of visitors and tourists, offering general information about local attractions, events and shows. When the novelty had appeared to have worn off and the content became more mundane, the local residents seemed to disengage with the display network, commenting it had become: "*Wooler-centric*" *(Host)* a term they used to criticize how content published by the Trust focused only on the geographic area of the centre of Wooler. For other hosts, outside of Wooler, the Trust had appropriated the display network to simply promote what they saw as important to Wooler, as well as use it almost as a public relations bargaining tool for securing further funding. One such example includes when a host noted their intention to distribute information about a proposed project, specifically noting how they would disperse updates to the community through the display network. Despite these remarks, local youth still found the community display useful in limited capacity as they regarded the content still relevant to them; however, there were also concerns from youth surrounding the dilution of youth specific

content as a result of it the network now catering to a wider range of information to suit the far broader audience of the general community.

Across both evaluation periods, unsurprisingly perhaps, as the curation of the display network content changed, so did the perceptions of its value and benefits for different stakeholders and residents' groups. With more access to displaying content distributed amongst the stakeholders, the display network appears to have blended into the landscape of rural life and is still perceived as an asset for the *'greater good'* of the community which encapsulates the feeling that having a networked display is generally an intrinsically good thing, despite an unawareness of who finds it useful. Yet, interestingly, having content that catered for different audiences was not always perceived positively by all groups, beginning to raise questions and show tensions regarding how the display network was governed.

5.8.2) Maintenance, administration and moderation

During the first phase of the GleNet's deployment, a number of issues emerged, which were promptly addressed in order to ensure the system was fit for purpose. After the initial two-month installation period, issues concerning hardware and software maintenance of nodes kept re-occurring, demanding the attention of the first author to repeat the 100-mile round journey every week from Newcastle-Upon-Tyne to Glendale. As the more technical issues were resolved and the system stabilised, the GleNet administrator, took it upon themselves to maintain the system, wherever possible. The common issues that affected the display network were the downtime and, in some cases, complete removal of WIFI infrastructure from some locations. The administrator was keen to ensure each node was updated regularly and would update the node manually by sharing her personal mobile data as a network hotspot. In other instances where the owner of the premises where the node was located (e.g. local café) removed WIFI, she would physically unplug the node and bring it back to the central hub, in order to

connect it to an accessible WIFI network; and once updated, she would then return it to location to reinstall it.

Attempts were made by the administrator and first author to engage with node hosts and other local residents to initiate them as local champions of their respective areas. It was thought that this newly created role could include the reporting of node problems, ensuring nodes were turned on and functioning correctly as well as operating as a more localised source of information for smaller communities outside of Wooler. Despite the effort of the GleNet administrator and myself, local champions were not be established which resulted in frequent visits throughout phase one to help with the upkeep of the display network. The first author had inadvertently taken the role of a supporting stakeholder in maintaining, installing and updating technical infrastructure, as well as removing and rehoming nodes from time to time.

Despite CoNet being initialised by a group of three stakeholders it soon became apparent that *R1* was bearing the strain of maintaining, managing and administering the network. *R1* possessed a technical background as well as being involved in a number of other technical community initiatives and projects within Rothbury itself. Since the installation of the display network in Rothbury, *R1* have been the point of contact responsible for anything concerning CoNet. In comparison to GleNet, there were fewer teething problems with the installation of CoNet resulting in a far quicker hand over process which allowed the first author to further distance themselves from the deployment details. At the time of writing, both display networks are now being administered, maintained and sustained by a single person who has seemingly been handed down the role from an initially small group of interested stakeholders. This inheritance of responsibility has taken place without intervention or involvement from me and has taken a degree of time to surface as a definitive role. These instances of sole responsibility for running each display network however, also meant that the systems were

being controlled by individuals (and organisations) who were acting as gatekeepers to the main content streams flowing through each network.

GleNet's administrators time was predominantly used for updating display content and developing other initiatives for tackling social exclusion; this work was remunerated by the funding grant. Since funding ended, the once full-time GleNet administrator was now tasked with other work, placing clear restrictions on the amount of time she could now spend updating the displays content, causing some tension between herself and the GGT director. Yet, despite this on-going tension, the administrator has continued to be the single point of contact for GleNet. While in their words, *"it only takes 5 minutes" (G2)* to update content, in practice, it can take far longer (as other trustees noticed); and *G2* herself observed that as more people get to know about it and see it as a means for free advertising, the more time she will need to update content for them. The administrator's dedication to the display network, means that she still spends a significant amount of time on updating the displays, despite ongoing tension with her employer. *"Yes, whenever anyone asks her how long it should take she says no more than five minutes and that's kind of the standard response now. Obviously, I have had a chat with her and she sees the value in it." (Host)*

Given the underlying tensions from within GGT surrounding management and content moderation; many within both Wooler and Rothbury communities voiced mixed feelings concerning the longer-term sustainability of the display networks. While strong arguments are being presented suggesting that the role of a single person in charge of the display network is critical to its longevity and consistency, enabling a more manageable workload for an organization; others argue for sharing the workload among community members and more democratic control over the content. From one hand, both of the current network's administrators are seen as experts given their training and experience being in-charge of the

networks for a long while; they are also seen as providing consistency over the content and its style, which both respective communities have become accustomed to.

However, administrative tensions, particularly from within the Trust, and complaints about the lack of democratic control among community members, led to envisioning the possibility of adopting alternative models of management and governance. The idea of potentially transferring the governance of the display networks to trusted community champions has been discussed with communities in these two deployments. From the Trust perspective, distributing governance to communities surrounding Wooler would help reduce the community perception that their display network is '*Wooler-centric*' (e.g. displaying content that is primarily about Wooler). Furthermore, distributing governance would also help reinforce the networks' image as a community resource and not just a public relations tool. With the eventual handover of GleNet and CoNet to their respective communities and volunteers, there are still prominent concerns surrounding trust, content consistency and the appropriation of the display networks by individuals to simply further personal agendas rather than to the benefit of everyone in the community.

Since before our study commenced, content was originally sourced by an employee of Trust who would simply convert information into a suitable format for displaying onto the photo frames. Ever since, content has been regularly sourced from key community stakeholders such as event coordinators, group leaders, local council as well as from within the Trust itself. Content typically arrived in the form of physical handouts such as posters, newsletters and newspapers, with an employee either scanning these into a digital image or hand typing them into a blank presentation slide. This approach typically resulted in no concern for the quantity of information being pushed out, or in fact its readability. During phase one of display's deployment, the content management system implemented a template-based approach to creating information and so the necessity arose for an administrator to now modify content to

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make it more suitable for being displayed. Content was very text heavy resulting in many people reporting poor readability in the initial evaluations. The content management system also presented a sudden learning curve for the administrator who additionally had to learn how to use HTML Markdown as an additional skill.

Following talks about implementing another network in Rothbury, the Trust invited key stakeholders from Rothbury to view the display network and demonstrate how it worked. Learning a lot from this experience, the now present administrator of what would be CoNet, a technically minded individual with a keen eye for design, began mocking up their own content for how they envisioned CoNet content. Their formatting style was far leaner in comparison, with reduced text as well as variations in color and images from one slide to another. The mocked-up content from CoNet was then shared with GleNet, as well as a presentation-like template file that was constructed. GleNet has strived to use this tool in a bid to restructure and refine their own content. Despite the guidance, GleNet persistently struggled to cut down their text-heavy content, as one node host commented: *"There was all the information of the activities they're doing and it's just far too much." (Host)*.

5.8.3) Tensions around control

When we firstly introduced the display networks in each area, unsurprisingly maybe, the systems generated enthusiasm due to their novelty. With phase one's GleNet deployment, the display network generated great expectations as it was seen as a potential sustainable solution to the social exclusion experienced by youth within the area. Such enthusiasm was exemplified by the display client's hosts' willingness to absorb electricity running costs from the outset. However, while most hosts were generally happy to provide content directly to the Trust for publication, some hosts did opt to remove their nodes due to frustrations surrounding their inability to publish content for themselves, independently away from the Trust. These display clients were subsequently re-located to new hosts within similar areas as specified by the Trust.

Initially the GleNet displays were seen largely as a Glendale Gateway Trust initiative in partnership with researchers. As time passed, this perception shifted towards the view that large outsider organizations were trying to impose on smaller communities. In particular, it was noted that especially rural communities outside of Wooler are keen to ideate and develop their own projects, with their own identity, thus distinguishing themselves from anything related or created in Wooler or by the Glendale Gateway Trust. Furthermore, as we have already explained, communities outside and surrounding Wooler often criticized the Trust for being '*Woolercentric*'. Considering the existing tensions between communities living within and outside Wooler and that the Trust retained full control over published content during the first phase of deployment, some node hosts slowly lost interest and the display network became a part of the background within their respective deployment locations. In light of this, node hosts were provided the necessary permission and access to publish content themselves as part of the redeployment of the display network in late 2017.

In sharp contrast, the idea and deployment of Rothbury's CoNet was created and launched from within the heart of the community with minimal input from the first author. Before the implementation of CoNet, the primary stakeholders deliberated extensively and deeply considered how the network could be optimally deployed and integrated into the community of Rothbury. This included a number of activities surrounding CoNet that explicitly aimed to foster community ownership and that directly involved the local residents and communities in a number of ways. For example, before the installation of the network, stakeholders launched a school competition inviting local pupils to suggest names, branding and a logo for the display network, which primary stakeholders themselves judged. Articles were written and distributed in anticipation of the network installation, which was published in monthly newsletters—Rothbury's OTB. Furthermore, the launch of the network itself was carefully planned to coincide with the weekend of the towns' annual Traditional Music

Festival—a very popular event which attracts thousands of residents and visitors from further afield. Following its successful launch and three months of uptime, the CoNet administrator began drafting policies surrounding the long-term management of the system in order to increase community involvement in the management and running of CoNet. Policies were also drafted which aimed to integrate the content production process with the OTB editors. The policies included guidelines and a simple website on how to install, maintain and contribute to CoNet, e.g. information about hardware, how-to-install guide, content management, rules on advertising and administration roles and responsibilities.

As time moved on, CoNet has been in constant use for just under 2 years. The administrator has become increasingly involved with the networks upkeep and is now the sole gatekeeper for the system despite the great lengths they went to in promoting it to local residents and stakeholders. In the process they have also secured grant funding to expand the network based on the ever-increasing demand for new nodes from different residents in the community within and surrounding area of Rothbury. However, what surprised us even more, was that the CoNet administrator recently started promoting the networks use at external events and community meetings in other towns and villages. For this they created their own copy of a node by attaching a raspberry Pi to a small 9" TFT monitor and portable battery pack as a demo display. Through their perseverance and passion for the project, Alnwick —another rural community within Northumberland is now willing to develop and host their own display network. With residents opting to be a part of the network as well as the dedication of CoNet's administrator, we whole heartedly believe the network has been adopted and is today integrated within the local community of Rothbury.

The CoNet administrators time, passion and dedication to the aims and objectives of CoNet has undeniably brought many successes, including a seemingly increased involvement and sustainable integration of the displays into the community's day to day life. However, on

the other hand, their involvement also meant that, over time, their role turned into the gatekeeper and ultimate judge of which content is or isn't allowed on the displays. Thus, even if virtually all content is consistently published by hosts, community tensions persist; with hosts in particular voicing discontent over gatekeepers' reluctance to authorize hosts access to publishing rights. At the time of writing, CoNet and GleNet's administrators are in the process of negotiating hosts full administrative publishing rights, yet there are significant concerns regarding the amount of trust these may require specifically in terms of the violation of display network policies.

5.8.4) Findings summary

In the findings of this chapter, I have outlined three themes. Firstly, 'GleNet's Woolercentricity' outlines the shift for how GleNet was used, first as a tool for youth engagement but more lately becoming a display mechanism for general community information. This shift in use case caused neighbouring communities and villages to now perceive the display network and its content 'Wooler-centric' – that is, focusing content primarily on activities and information pertaining to the town of Wooler where the administrative stakeholders are based. Secondly, 'maintenance, administration and moderation' explores how both respective network's running was eventually devolved to one committed stakeholder, reflecting on how each stakeholder chose to run their network and the influence it had on network maintenance, administration and content moderation. Lastly, 'tensions around control' exposes the intra-community tensions that have grown between administrators and hosts, caused by administrator reluctance and lack of trust to distribute control amongst others in order to maintain network consistency.

5.9) Chapter summary

This chapter has detailed my reflection and findings from two longitudinal display deployments which took place in rural Northumberland, North East of England. In the reflection, I

summarise the trials and tribulations of the realities of deploying networked public displays. In the findings, I presented a cross comparison account of the subtle differences which took place in the approach of the network administrators, which surfaced insights into the emergence of community tensions, insight into aspects of maintenance and administration, as well as perceptions of control for public display technology. In contrast to GleNet, CoNet is a responsive deployment that has been harmoniously integrated into its local community by engaging residents in the setup process which has helped in the construction of its identity. CoNet became a brand of its own as it was named by community stakeholders and given a formal introduction to the wider community through print distribution. The administrator, *R1*, has continuously and consistently broadcast updates through local media channels about Showboater and resulting in a strong community standing. Its administrator (*R1*) is an enthusiast who is willing to dedicate the time, effort and motivation its operation, maintenance and governance. Whilst both GleNet and CoNet were led by enthusiasts, differences in their personal capabilities, commitment and motivation have had significant impact on how the networks have been perceived by the wider community. GleNet, whilst still used as a digital signage network is underutilised in comparison.

6) Police Engagement: Context and Methods

To fully understand how people and systems can support resource constrained communities, and specifically understand the role of an intervention in interfacing with communities, this chapter departs from the rural setting of Northumberland and instead focuses on the urban. The study takes place alongside the communities of Newcastle-Upon-Tyne, Gateshead and Sunderland as built-up areas which are characterised as being far more densely populated and have a richer and far greater diversity of supporting infrastructure available to them than in rural Northumberland. However, despite this apparent abundance of support mechanisms available to communities in urban areas, service providers, such as police, local government and charities struggle to engage meaningfully with their communities. In contrast to case study one which examined the role people play in sustaining public displays and supporting intra-community engagement, this study alternatively seeks to understand how an intervention for police officers can support communities by bolstering public service engagement through a unique collaboration with Northumbria Police as the local police force responsible for covering the North East. Working with neighbourhood officers, I engaged in action research to develop and refine a training programme to enable officers to better support communities and address issues of resource constraint, as well as foster police-community relations.

This chapter outlines the background work conducted with Northumbria Police which ultimately led to my involvement and subsequent re-design of the pilot police training programme for neighbourhood officers in Gateshead. The training programme itself is based on a world café engagement methodology which has been tailored for policing purposes. More broadly, the case study works alongside other partner organisations such Gateshead and Newcastle Council as well as other partner agencies such as housing associations and local charities from the area.

6.1) History of deprivation in the United Kingdom

Direct measures of poverty that look at deprivation and living standards have a long history, particularly in the United Kingdom (Townsend, 1982). Deprivation is not a measure of income, but more a measure of how people live across time; deprivation is the consequence of a lack of income and other resources, which cumulatively can be viewed as living in poverty (Townsend, 1982). Other resources, or access to adequate standards of these resources are also take into account, for example: diet, clothing, fuel & light, housing and housing facilities, the immediate environment of the home, security, recreation, education and social relations. It is important to make the distinction here between poverty and deprivation because poverty by itself is considered a temporary experience, therefore lasting a short amount of time for some people, and a longer amount of time for others and is solely based on income (Smith *et al.*, 2015). Indices of poverty typically only represent a snapshot of a particular timeframe, whereas deprivation factors in all aspects of living to build a timeline of longitudinal poverty across a far greater expanse of time[55]. Understanding the ways in which poverty are measured help to form a picture of how a longitudinal perspective of deprivation have been constructed, throughout recent history.

In the 1950's, after the Second World War, it was widely assumed that instances of poverty had been overcome in the United Kingdom. These assumptions were derived from a study which demonstrated that in 1950, only 1.5% of the population surveyed lived in poverty, compared to 18% in 1936 (Joseph Rowntree Charitable Trust, 2004). Transitioning into the 1960's, this figure grew up to 8% as further population studies took place to understand what proportion of the United Kingdom were considered to be living in poverty. Following on from the Second World War, the 1950's and 1960's major contributing factor to living in poverty was directly related to the poor state of housing conditions people lived in. For example, in the

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[55] https://fullfact.org/economy/poverty-uk-guide-facts-and-figures/

1960's there were an estimated 3 million families living in highly overcrowded housing conditions. In the late 1960's, further studies revealed that 11.7% of all homes were unfit for purpose (Townsend and Bosanquet, 1972) which resulted in those people being categorised as in poverty. At this point in history, the term poverty and deprivation were seemingly interchangeable however, as we can see poverty was beginning to take account of other factors other than income (e.g. housing conditions). The 1970's witnessed a different approach to measuring deprivation (effectively long-term poverty) which did not solely take into account income. There was realisation that the wider environment, housing standard and factors of employment also helped to paint a more accurate picture. With these new factors in mind, deprivation figures (previously termed poverty) were revised and considered to be approximately 9.9% in 1973 (Poverty.org.uk, no date). Levels of deprivation continued to rise with 13.7% of the UK population in poverty in 1979, with the highest poverty figures peaking at 25.3% in 1996 (Poverty.org.uk, no date). In 2004/2005, deprivation had begun to drop and was measured at 20.5% because of huge increases National Insurance benefits[56] and introduction of the National Minimum Wage Act in 1998 [57].

How deprivation was measured up to 2004 varied as there was no official measure of how deprivation was measured in the United Kingdom. Between 1950 and 2004, poverty could be derived by three different measures including relative poverty, the National Assistance scale and the Supplementary Benefits Scale (Fiegehen, Lansley and Smith, 1977). From 2004[58], the government embraced a new model which took into account 7 domains for considering and assessing the level of deprivation in specific areas, across the United Kingdom (Department for Communities and Local Government, 2016). These 7 weighted domains help to assess overall relative deprivation: income (22.5%), employment (22.5%), education and training

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[56] http://www.poverty.org.uk/state-benefit-levels/
[57] https://www.legislation.gov.uk/ukpga/1998/39/contents
[58] https://data.gov.uk/dataset/59599787-bd50-4500-a409-fc586260dbbd/index-of-multiple-deprivation-2004

(13.5%), health and disability (13.5%), crime (9.3%), barriers to housing and services (9.3%) and living environment deprivation (9.3%). There are also seven domain-level indices which are separately collected for both children and older people (Department for Communities and Local Government, 2016). This seven domain model is still in use today and can be seen in the latest deprivation report from 2019 (Ministry of Housing Communities and Local Government, 2019).

Throughout the 1900's there has been the existence of a welfare state in the United Kingdom in some form or another. In the 2000's the welfare state is concerned with education, health, unemployment and sickness allowances as its central services. Core services, such as the National Health Service, Jobseeker's Allowance, Child Benefits, Housing Benefits and Universal Credit were available to eligible persons throughout the entire United Kingdom as a standardised government policy. In early 2000's (2000 – 2007), the government's annual spend for maintaining the welfare state averaged 109 billion pounds[59] with the majority of spending going towards pensions.

In 2008, the United Kingdom was hit with the Great Recession, a spectacular period of negative economic growth caused by a combination of developing vulnerabilities in the financial system and subsequent triggering events that began with the burst of the United States real estate bubble. Across Europe there were sharp drops in countries Gross Domestic Product (GDP), tiggering a decline in investment and consumer spending. People's homes were reduced in value, business failure rate increased due to severely restricted trade which consequently pushed unemployment up to 1.79 million (Arnold and Smith, 2009). Most critically, government debt rose sharply in the United Kingdom (to 600 billion, Arnold and Smith, 2009) which forced a severe wave of cutbacks which affected all 326 local councils across the United Kingdom. The austerity measures coupled with cutbacks and economic

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[59] https://www.ukpublicspending.co.uk/uk_welfare_chart_40.html

downturn were particularly severe on local councils who saw a reduction in public spending which led to public service cuts and regeneration scheme[60] abandonment (Figure 39).

City	Change (%)	City	Change (%)
Aberdeen	-2.4	London	-21.1
Aldershot	-13.5	Luton	20.9
Barnsley	-40.4	Manchester	-16.9
Basildon	-3.7	Mansfield	-16.0
Birkenhead	-9.5	Middlesbrough	-17.8
Birmingham	-13.1	Milton Keynes	-7.1
Blackburn	-26.7	Newcastle	-26.6
Blackpool	-3.3	Newport	-4.8
Bournemouth	-2.5	Northampton	-9.4
Bradford	-16.2	Norwich	-6.2
Brighton	-22.4	Nottingham	-8.1
Bristol	-15.3	Oxford	14.7
Burnley	-22.6	Peterborough	-9.5
Cambridge	-12.5	Plymouth	-12.0
Cardiff	-5.5	Portsmouth	-10.5
Chatham	-9.0	Preston	-5.1
Coventry	-19.5	Reading	-4.9
Crawley	-5.4	Sheffield	-22.4
Derby	-12.0	Slough	-23.1
Doncaster	-30.6	Southampton	-9.7
Dundee	-2.8	Southend	-7.9
Edinburgh	-8.8	Stoke	-24.0
Exeter	-16.8	Sunderland	-21.1
Glasgow	-23.3	Swansea	-3.9
Gloucester	-23.4	Swindon	-5.4
Huddersfield	-23.0	Telford	-19.4
Hull	-23.1	Wakefield	-30.1
Ipswich	-17.8	Warrington	-6.3
Leeds	-12.2	Wigan	-18.6
Leicester	-21.3	Worthing	-14.4
Liverpool	-31.8	York	-10.4
Great Britain	-14.3		

Change in total expenditure, 2009/10 – 2017/18 (2017/18 prices, %)

- -40.4 - -30.1
- -30.0 - -18.6
- -18.5 - -10.4
- -10.3 - -2.4
- -2.3 - +20.9

Figure 39 Change in total spending, 2009/10 - 2017/2018 (local authority spending)

People and communities who were already living in areas of deprivation felt the effects of austerity even harder than most (Figure 40). The main groups of people who were particularly affected were the unemployed, those on low wages, elderly and the young and/or disabled. The sharp rise in the cost of living coupled with poorly paid unstable employment (e.g., introduction of zero-hour temporary contracts) led in-work poverty. Many of the government's safety net policies surrounding tax credit and the benefits system began to become less generous which only added to people's emotional stress, decreased well-being and loss of earnings[61]. Due to austerity measures, welfare spending dropped by 25% during the following decade of austerity (2008-2018). There were large cuts imposed on benefits schemes

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[60] For example, https://www.swansea.gov.uk/regenerationplans
[61] https://www.poverty.ac.uk/editorial/impact-austerity-deprived-neighbourhoods

which supported the disabled, tax credits (4.6 billion), universal credit (3.6 billion), child

benefits (3.4 billion), incapacity benefits (2 billion) and housing benefits (2.3 billion)[62].
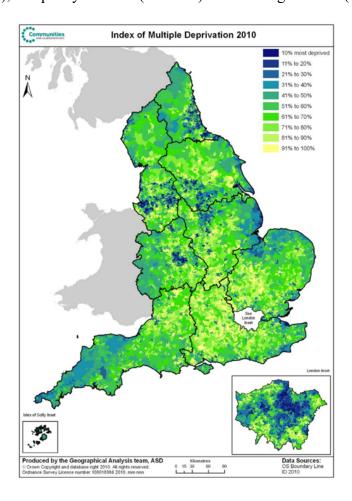
Figure 40 United Kingdom deprivation statistics for 2010 demonstrating 56% of the 326 local authorities contained at least one area categorised as 'most deprived' (Department for Communities and Local Government, 2011)*.*

The reduction in public spending originated from the Conservative government's austerity programme following the Great Recession of 2008. The programme outlined a plan of sustained reduction in public spending and tax rises which aimed to reduce the government budget deficit and reduce the role of the welfare state. The programme of austerity stemmed from the need to reduce the country's spending, but also motivated by Conservative government minister's argument that there was an unhealthy and growing culture of welfare dependency in the United Kingdom, which they sought to reduce by cutting down the welfare

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[62] https://www.centreforcities.org/reader/cities-outlook-2019/a-decade-of-austerity/

bill[63]. In addition to welfare changes, police forces throughout the country were subject to major cutbacks which saw police numbers fall by 20,000[64] causing police to make use of reserve funding and sell off capital assets to meet demands (Institute for Government, 2019).

6.2) Police and community policing in the United Kingdom

Policing in the United Kingdom was professionally established by Sir Robert Peel in 1822. Prior to this, law enforcement was organised on a community level and consisted of watchmen and constables, but the government was not directly involved (Law Enforcement Action Partnership, no date). Modern policing encompasses a number of law enforcement roles including that of Territorial Police constables (regular police officers), Special Constables, British Transport officers, Ministry of Defence Police officers and the Civil Nuclear Constabulary officers. Most notably of the aforementioned branches of law enforcement are the Special Constabulary who exist as a voluntary sub-organisation which operate alongside territorial police officers. Special constables, despite being volunteers, are the same as fully qualified territorial police officers but operate as and when needed (College of Policing, 2013). The model of policing adopted ensures that police officers exercise their powers to police with the consent of the public; this is called 'Policing by Consent'[65]. Any person who is in the position of serving in the role of law enforcement abides by the public's consent to police, as well as adhering to 9 core policing principles which dictate the manner in which policing is carried out in the United Kingdom. In 2004 there were 140,000 individual territorial police officers spread across the 43 police forces in England and Wales.

The role of a territorial police officer is typically quite varied in what they can be asked to carry out as part of their day-to-day routine. However, there are two roles of police officers which help to define what their main aims are and in what way they contribute to wider society.

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[63] https://www.bbc.co.uk/news/uk-politics-19874361
[64] https://www.nytimes.com/2019/02/24/world/europe/britain-austerity-may-budget.html
[65] https://www.gov.uk/government/publications/policing-by-consent

The first role of a territorial police officer is that of a 'first responder'; this defines an officer who will respond directly to critical incidents at grade one. In the United Kingdom, each police force has its own grading response tailored to its demographic and environment which dictate how incidents are dealt with. For example, Greater Manchester Police utilise a 5 tier system (Figure 41) which outlines the incident categorisation and associated response time expected of officers when responding to an incident (Greater Manchester Police, 2017). For example, a member of the public calls the police to report a murder; this would be classified as a Grade 1 emergency response incident whereas, someone calling about the poor maintenance and disrepair of their pathway or streetlighting would be handled over the phone by signposting the person to the appropriate council services. The role of a first responder is to attend Grade 1 incidents which are urgent and time critical; this role is commonly portrayed by television programmes which follow police officers around from incident to incident in rapid succession. If a police officer is not in the role of a first responder, they are most likely in a secondary role as a 'neighbourhood police officer'; a more community orientated officer who is responsible for and accountable to the communities they serve (College of Policing, 2020a) however, this is not to be confused with a 'community police officer' as America's equivalent (Bureau of Justice Assistance, 1994) or the community driven 'Neighbourhood Watch' scheme in the United Kingdom[66].

4.0 GMP Graded Response Policy.

Grade 1 : Emergency Response	Attendance within 15 minutes of call receipt
Grade 2 : Priority Response	Attendance within 1 hour of call receipt
Grade 3 : Routine Response	Attendance within 4 hours
Grade 4 : Scheduled Response	Attendance or other resolution within 48 hours
Grade 5 : Telephone Resolution	First-time telephone resolution of a call

Figure 41 Greater Manchester Police 5 tier grading system for incident response (Greater Manchester Police, 2017)

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[66] https://www.ourwatch.org.uk/

Neighbourhood policing has roots in the UK which stem back to the beginning of the 1980s' with the original aims set for reducing crime, fear of crime and improving public confidence. In 2003, the government launched the National Reassurance Policing Programme (NRPR) as a pilot project set in eight police force areas in the United Kingdom (Tuffin, Morris and Poole, 2006). The success of the NRPR programme led to the official integration of Neighbourhood policing into the United Kingdom's policing model in 2005 along with the creation of the Police and Community Support Officer (PCSO) role. By 2008, 25,000 PCSO's had been recruited who were dedicated neighbourhood policing personnel assigned to work alongside neighbourhood police officers as part of a neighbourhood policing team. At the time, neighbourhood policing met the Labour government's desire to provide the public with "a greater say in the kinds of services they wanted (the notion of 'choice') and more opportunities to engage with service providers" (Longstaff *et al.*, 2015).

The teams (sometimes known as the 'Safer Neighbourhood' Teams) are responsible for providing an accessible, responsible and accountable presence to the local community. Typically, neighbourhood teams are situated in or very close to the community they serve, so that they can embed themselves as a localised service. Officers are responsible for working collaboratively with other officers, members of the community, the local council and partner agencies to address issues and problems to build trust, confidence and develop a detailed understanding of the community (College of Policing, 2020b). Neighbourhood officers do not usually attend Grade 1 incidents however, they can, and will should there be no first responders available at the time; neighbourhood officers typically respond to grade 2 and below as a less urgent response. The Police Foundation states that "neighbourhood policing provides the capacity to respond to on-going problem's rather than just reacting to incidents, to understand specific risks and dynamics of places and communities, to involve others in delivering creative, preventative solutions, and to develop personal relationships with local people, businesses, as

the basis for influencing decisions" (Higgins, 2017). In 2007, Flanagan reviewed the implementation of neighbourhood policing and argued it was a 'core' activity for police forces but, acknowledged it should be able to operate flexibly and fit to the local context. Flanagan's recommendation for neighbourhood policing identified three critical factors for ensuring its successful delivery: 1) visible, accessible and locally known authority figures 2) community involvement and 3) strong relationships and joint working with partner agencies (Flanagan, 2008; Longstaff *et al.*, 2015).

6.3) Policing and austerity in the North East

In early 2010, the Labour government issued its national strategy which outlined their commitment to neighbourhood policing, despite the recession, and also included protected funds for PCSO's and continued operation of neighbourhood policing. Within two years of the new coalition government being in power, the protected funds promised to neighbourhood policing were removed resulting in a 22% loss of PCSO's between March 2010 and March 2015 (Longstaff *et al.*, 2015). Further cutbacks continued in the years which followed which drove a wedge between neighbourhood police and their local communities; officers had less and less physical engagement with their communities which had become increasingly transient and diverse. Neighbourhood officers were attempting to meet the public's safety expectations and demand for visible presence and engagement whilst their own resources dwindled (Longstaff *et al.*, 2015).

A near decade of cutbacks inflicted on police forces have had a dramatic longstanding effect on the public's perception of confidence and safety. Sindall and Sturgis highlighted a steady decline in community confidence in policing which has instigated perceptions of mistrust amongst communities (Sindall and Sturgis, 2013). Later, a poll of 1500 people

conducted in 2018 reported 78% of people perceived funding cuts had made areas less safe[67].

To illustrate this point further; violent crime has risen 71% between 2012 and 2018 in London alone, with three quarters of the boroughs in London with the highest levels of violence also in the top ten most deprived areas of the capital[68]. Drugs and weapons offences, violence, robbery and sexual offences are all over two times more prevalent in the most income-deprived 10% of areas compared to the least income-deprived 10% (Figure 42).
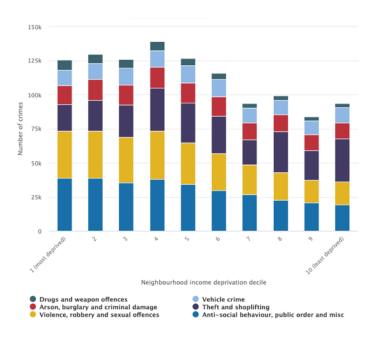
Figure 42 Crimes recorded by neighbourhood income deprivation decile in London 2018-2019 (Trust for London, 2020)

Similarly, instances of domestic violence in deprived areas of the country have risen proportionately[69] indicating a strong link between higher rates deprivation and higher rates of crime as a direct result of the impact of austerity measures (Cuthbertson, 2018). Cuthbertson also reflects on crime and deprivation by highlighting that those in deprived areas are also the most likely to be affected by crime due to their far greater likelihood of living near criminals and being their victim (Cuthbertson, 2018). It is a common misconception that because

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[67] https://www.independent.co.uk/news/uk/politics/police-conservative-austerity-cuts-public-safety-theresa-may-research-a8626786.html
[68] https://www.theguardian.com/politics/2019/jul/15/knife-crime-tory-austerity-sadiq-khan-london
[69] https://whatworks.college.police.uk/Research/Research-Map/Pages/ResearchProject.aspx?projectid=774

deprived areas are closely associated with higher than average crime levels, that the community themselves take a negative view of police, however it has been demonstrated that this only applies to a very small minority (Cuthbertson, 2018). Perceptions towards police in deprived areas are generally good, as people really rely on police more often than non-deprived areas. Due to the overwhelming surge in crime and reduced police officer numbers, police forces no longer have the same capacity to engage with communities, other than dealing with instances of crime. However, as the public's perceptions of police in 2018 demonstrate (Cuthbertson, 2018), there still appears to be an appetite for community engagement with police forces. Since the Great Recession in 2008, all police force budgets have been cut by an average of 16% however, the effects were not felt equally due to the different sizes of police forces (Institute for Government, 2019). Northumbria Police, located in the North East of England (Figure 43), was the most affected by austerity cutbacks which saw a reduction of over one thousand police officers and reduction in spending, totalling £136 million (HMIC, 2012a; Brown, 2021) which was also detrimental to the level of support they could offer towards communities.

Figure 43 Northumbria Police force area, highlighted in red. Image sourced from Wikipedia, 2021.

Considering that any police force's majority spending is devoted towards the cost of staff, Northumbria Police was no different and between 2010 and 2015 it began to re-allocate

staff from community and neighbourhood roles to first responder roles. Officers who were working with PCSO's became first responders, if they were not removed altogether. First responding officers were cut back by 17% (-730 police officers). PCSO's (as specialist community orientated officers) were cut back 42% (-180) in comparison. Northumbria Police also made organisational changes which saw administrative staff reduced by 47% (-980) (HMIC, 2012a). Clearly, community policing suffered dramatically during austerity cutbacks which disproportionately reduced the number of PCSO's against territorial officers across the force area. Northumbria Police's first response as a way of mitigating the reduction in workforce capacity was to explore different ways of interacting with the public such as a greater use of internet and social media, and reviewing the number of face-to-face access points (police stations, libraries, public authority buildings etc.) needed (HMIC, 2012a). Northumbria Police also established a small bespoke team of specialised and experienced neighbourhood territorial police officers to monitor community tension and engagement; this team was called the Central Engagement Team (CET)[70] and they were responsible for fostering existing relationships with key community stakeholders and partner community groups in Newcastle Upon Tyne and Gateshead.

The CET maintains in close contact with local schools, charities, religious groups, council representatives and partner agencies such as Newcastle Housing Association. The CET are proactive in their approach to supporting communities with their core aim of reinstating a friendly police presence and face-to-face gateway to police services for communities. For example, the CET may do this through outreach events such as presentations to local schools around knife crime, public engagement opportunities with segregated communities (e.g. Chinese or Indian community etc.) or attending Friday prayer with localised Muslim communities.

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[70] https://twitter.com/npcengteam?lang=en

	31 March 2010 (actual)*	Planned Change 31 March 2010 – 31 March 2015*	% change in Northumbria	% change across England and Wales
Officers	4,190	-730	-17%	-10%
PCSOs	440	-180	-42%	-10%
Police staff**	2,100	-980	-47%	-19%

Figure 44 Northumbria Police austerity measures on territorial officers, PCSO's and police staff (HMIC, 2012a)

Historically, the North East of England is one of the most deprived and poverty-stricken regions of the United Kingdom (Centre for Local Economic Strategies, 2014). This is due to a historic trend of under-investment in the North East, lower average wages[71] and comparatively low public spending (Centre for Local Economic Strategies, 2014). The effects of austerity stemming from 2010 have only further increased deprivation figures throughout the North East. For example, per 100,000 of the population, the North East is 29% above national average for home care, 41% for day care and 100% above for short-term residential care (Centre for Local Economic Strategies, 2014).

Figure 45 illustrates the high levels of deprivation as recorded in 2010, whilst Figure 46 displays the deprivation landscape on the outskirts of Newcastle Upon Tyne.

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[71]

https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/bulletins/annual surveyofhoursandearnings/2013-12-12

Index of Multiple Deprivation 2010

	Percent
England	20
North East region	32
County Durham	29
Darlington	27
Gateshead	39
Hartlepool	48
Middlesbrough	54
Newcastle upon Tyne	38
North Tyneside	24
Northumberland	15
Redcar and Cleveland	36
South Tyneside	40
Stockton-on-Tees	30
Sunderland	37
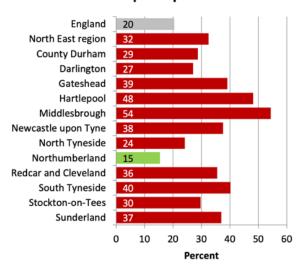
Figure 45 Index of Multiple Deprivation 2010 for the North East of England

Northumbria Police headquarters is located in the town centre of Newcastle Upon Tyne and from that single point they direct their coverage of the Northern territory (Northumberland and North Tyneside), Central territory (Newcastle Upon Tyne and Gateshead) and the Southern territory (Sunderland and South Tyneside).
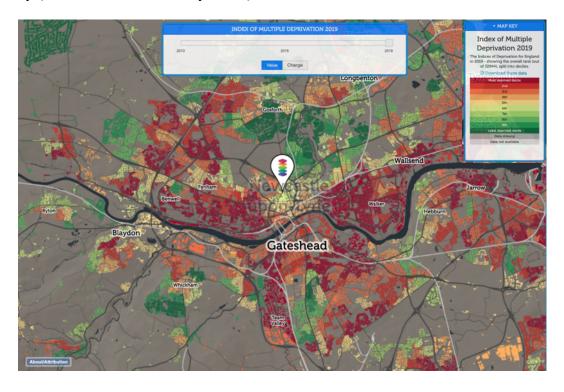
Figure 46 North East Deprivation Map: Newcastle-Upon-Tyne and Gateshead

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With high levels of deprivation in the North East, and in particular, the surrounding suburbs of Northumbria Police's Central territory (Newcastle Upon Tyne and Gateshead), the force's Special Constable recruitment initiative was accelerated, along with every other police force in the United Kingdom. Police forces across the country were trying to attract new volunteers to help relieve pressure on their reduced workforce. As a result, Special Constable numbers have sharply risen in the United Kingdom by 18.8% in 2011 (HMIC, 2012b). As a student at Newcastle University in 2016, I began my volunteering journey with the Special Constabulary in February 2016.

6.4) Trust and civic engagement methods

Trust is an integral part of human nature, but even more so when considering police-community engagement as it underpins how people form relationships, as well as a being a core component which aids inter-personal communication between people (Lankton, Mcknight and Tripp, 2015; Simpson, 2015). As such an important and prevalent aspect of policing, trust has been the focus of many HCI research projects, in different contexts, which have tried to unpick the complicated factors that support trust more broadly. For example, earlier research has studied trust as a relationship between 'users' (people) and technology, mainly focusing on on-screen elements and interactions. Later research from the past two decades has expanded to examine how trust can be fostered in the relationships between researcher and participant, researcher and community, intra-community and most recently, the relationship between community and local government or public service (such as police) (e.g. Jones and Marsh, 1997; Lee, 2002; Harding *et al.*, 2015; Corbett and Le Dantec, 2018). In this subsection I will focus on the latter two broader categories which examine trust dynamics in the context of community and civic authority, as well as public engagement methods.

Le Dantec and Fox highlighted the importance of building trust between researcher and participants when engaged in research activities with research participants in a community

setting (Le Dantec and Fox, 2015). In 2001, Carroll noted how the term 'community' in itself has been watered down in the past decade leading up to his journal article 'Community Computing as Human Computer Interaction', to the point where it was inclusive of online communities, user communities, design communities, virtual communities and small gatherings of people with a shared interest. As already mentioned in chapter 3.5, I make reference to a community in its more traditional meaning of a 'proximate' community; a group people typically situated in the same geographic area (Le Dantec and Fox, 2015) who share similar impact indicators (Balestrini *et al.*, 2014). Carroll, (2001) characterised people in these communities as living in small, relatively isolated groups who cannot afford to initiate avoidable conflicts. People living in a proximate community regularly deal with each other on a daily basis, as well as mutually competing for local resources and relying on others in times of crisis (Carroll, 2001). "Activity occurs through minimally co-coordinated and highly localised initiatives" which is orchestrated through confederations of autonomous subgroup members who are intrinsically motivated by personal initiative to carry out community tasks. In such communities, there typically exists a broad spectrum of people who exist at all phases of life (children, teenagers, siblings, friends), personal roles (parents, siblings, friends) and all occupations (teachers, shop owners, police, volunteers) (Carroll, 2001).

Within HCI, trust is a singular characteristic which forms as a part of engaging with people as the universal need to understand users extending to their interactions with technology, specifically concerned with a turn towards 'user experience' and design (McCarthy and Wright, 2004) which has also been employed in a civil service context. Civic engagement is a term which directly refers to a collective action, initiative by civic authority, which addresses a particular public concern (e.g. this could be around police and community safety or another societal or community activity). Civic engagement in itself is viewed as work carried out collaboratively between citizens and public officials (Corbett and Le Dantec, 2018b).

Harding *et al.* (2015) highlights that because of the nature of of civic work, it is often difficult for people (as citizens) to truly understand and appreciate such activities and attempts to engage with them because of the lack of comprehension of the activity or its purpose and existing underlying mistrust or suspicion. Attempts within HCI have been made to break down such barriers to civic/public engagement (e.g. Klaebe *et al.*, 2007; Harding *et al.*, 2015; Crivellaro, *et al.*, 2016) which have taken inspiration from HCI design methodologies as a means of breaking activities down and building trust relations incrementally.

6.5) Working with Northumbria police (action research)

This case study follows an action research approach to working with Northumbria Police. As outlined in section 3.3), it is fundamental for a researcher to fully understand the context they are working in, as well as being able to build effective trust and rapport with potential stakeholders. Normally, with an organisation such as a police force, it would not be possible to fully integrate with stakeholders due to the confidential, and sometimes dangerous, nature of being in the role of a territorial police officer. Prior to undergoing any research activities as part of this case study, I signed up as a volunteer Special Constable for Northumbria Police in late 2015, commenced training in spring 2016 and was attested in June 2016.

The role of a Special Constable is identical to that of a full-time (paid) police officer whereby trained volunteers are given the same legal powers and jurisdiction as full-time territorial officers. This role is not to be confused with the role of a PCSO, who are employed by police forces to solely provide operational support to fully warranted police officers in a community and neighbourhood environment and have minimal legal powers of their own. As part of my role as a Special Constable, I was required to contribute a minimum of 16 hours a month. In the role of a Special Constable with Northumbria Police you were given the freedom to develop yourself in any way you wanted; in practice, this meant you could go directly into

the role of a first responder (with support from other officers) or go into a neighbourhood role (again, with support).

At the beginning of my journey, I worked with the Byker neighbourhood (Community) team but later moved to the role of an independent first responder operating out of Whickham police station, covering the area of Gateshead from summer of 2017. As part of my own Continued Professional Development (CPD), I had gained enough experience to be trusted to operate independently and operate the police vehicles proficiently. I continued in the role of a first responder up until the point of my departure from Northumbria Police in November 2019 to pursue a career in academia. Research activities as part of this PhD and case study commenced in November 2017 and were active up until my departure in November 2019.

From my experience of working as a first responder and in a neighbourhood and community context, I developed an understanding of how community engagement is conducted across Northumbria Police. Engagement takes the form of two methods; firstly, 'Police and Communities Together' (PACT) meetings permit neighbourhood residents the opportunity to engage directly with representatives from their local neighbourhood policing team, council and other supporting partner agencies such as the local housing association. From a policing perspective, it is widely acknowledged that this format of meeting is characterised by low community attendance because of an overwhelming public perception that the meetings are unproductive, slow to make decisions and even slower to act on them. Moreover, PACT meetings appear to be intimidating for residents due to the formality that comes along with meeting key workers, such as the police as an authority figure. For the most part, members of the general public are not familiar with how or where these meetings take place. Residents who typically attend PACT meetings are typically already proactive members or key stakeholders from within the community and understand the inner workings of their community. PACT meetings can serve as a potential breeding ground for hostile and argumentative exchanges

between official representatives and the members of the community who are often dissatisfied at the services they receive from these public organisations.

Another engagement strategy employed by Northumbria Police was an initiative aptly named *'Cuppa with a Copper'* (Figure 47), which was an attempt at offering communities the opportunity to directly engage with police officers face-to-face in order to dispel misconceptions and myths. Police officers who attended these initiatives, which took place in public places such as community hubs and parks, were asked to try and engage with members of the public in a more casual and friendly setting as an attempt to build rapport and strengthen trust relations. However, these initiatives had a number of problems including low community attendance which was caused by a general disinterest in the police which had been built up by a legacy of other failed engagement initiatives (such as PACT). Surprisingly, police officers also displayed little enthusiasm to engage with members of communities because of their awareness of community disinterest. Many officers did not consider the initiative a core policing practice, instead it was typically perceived as a poorly implemented public relations scheme devised by Northumbria Police's marketing department.
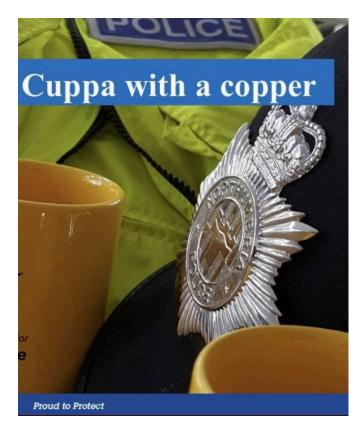
Figure 47 Northumbria Police: Promotional material for 'Cuppa with a Copper'

Police officers of all kinds do struggle to engage with members of the public despite public engagement actually being outlined as a core element of policing[72]. PACT meetings still exist and continue to offer communities with an opportunity to bring together police and residents, as well as a place where residents can engage with representatives of other services and organisations. Smaller, police-led initiatives, like 'Cuppa with a Copper' are no longer practiced and are now instead actively avoided by police officers because of the resentment they generate.

6.5.1) Overview of action research cycles

Action research has been configured differently to how it was applied in the previous case study. Here, I am bootstrapping onto an initiative which Northumbria Police have already committed to run as opposed to working in rural Northumberland where I initiated the

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[72] https://www.app.college.police.uk/app-content/engagement-and-communication/engaging-with-communities/

activities. The fundamental difference being how organisations such as Glendale Gateway Trust and other stakeholders lacked capacity to fully engage with the roles but here, Northumbria police do possess the capacity to engage with the intervention but, there lacks proper configuration and definition of the process they should follow. Because Northumbria Police are leading the initiative, this makes this case study very opportunistic by nature and far more open to change as the initiative unfolds, ideas are generated as new opportunities emerge. In this instance, the initiative being bootstrapped onto is Northumbria Police's neighbourhood police officer and PCSO initiative to learn a new format of community engagement grounded on the principles and activities of a World Café. A World Café is a structured conversational process for knowledge sharing in which groups of people discuss a topic around several small tables, a physical setting very similar to that found in a café. The process is typically characterised as being simple, effective and a flexible way for hosting large group dialogue between diverse people[73].

A community World Café is all about creating a 'special' environment where people can meet informally. As the name suggests, the meeting place is often modelled on the typical layout of a café. This includes small clusters of tables which are covered with a paper or linen tablecloth with pens, food, drinks and items available for people to use (Figure 48). Participants use the items on the table to record their thoughts, perspectives, emotions or ideas. It is encouraged that everything uttered by participants is noted down for purposes of a data harvest at the end of the event. World Cafés are typically held in publicly accessible locations, such as schools, sports clubs and community centres that have capacity for large gatherings such as community centres, cafes, sports halls or public buildings[74]. When the World Café event begins, the café host will welcome members of the community and an introduction to the World

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[74] http://www.theworldcafe.com/key-concepts-resources/world-cafe-method/

Café process which helps to set the context, the World Café etiquette as well as generally putting people at ease.

The World Café process typically consists of three or four rounds of questions. Each round takes approximately 10 to 20 minutes and asks members of the community to discuss their responses to the questions which has been posed. Each round's question is pre-prepared for the world café and specifically crafted to prompt conversation as an open question. Typically, each table is made up of four to six participants who will discuss the question as part of the World Café process. A table facilitator is also present at each table who helps to moderate the conversation and ensure it is productive. All responses are noted down, using the tablecloth as the way of recording responses to questions. Everything spoken during the round should be written down somewhere so that it can be analysed later on. At the end of each round, the tablecloth containing responses is renewed and the next round begins with a new question and the process starts again. At the end of the rounds, the tablecloths and any other materials used to record discussion points is collected as part of the 'harvest'. Each round's responses are analysed across the World Café event and major discussion topics and themes are generated from the notations made on the tablecloths. The topics and themes help to identify the major points that were raised across the round, and which of these were important to the members of the community. A final report is normally generated which gives an overview to facilitators of the major insights.

Figure 48 An example of a world cafe table setting (left) and an example of participant engaging in a world cafe event (right). Both photos sourced from Byker world cafe, 27th September 2017.

After a world café event there is a follow up event which is an opportunity to bring the community back together and discuss the outcomes of the event. The follow up is typically the occassion where any actions or decisions are made, following on from the in-depth discussion and exploratory conversations which took place during the world café event. Original attendees of the world café are invited back so that they are kept informed and can be included in any outcomes or next steps.

Northumbria Police is attempting to use the world cafe methodology as a way of re-engaging with members of the community. The action research cycles that follow depicts how I became involved in Northumbria Police's initiative for using the world cafe methodology as a technique to reach out to its communities. I outline two complete action research cycles which describe the journey of planning, designing, deploying and reflecting on how a world café intervention can be designed and configured to bolster community-police relations.

6.5.2) Plan. Mutual Gain and Northumbria police

In spring of 2017, Northumbria Police's Chief Inspector of Gateshead (*PM1*) began enquiring into alternative methods of community engagement for their own neighbourhood police officers. Northumbria Police later purchased a series of training sessions from a company named Mutual Gain who specialise in offering police force engagement strategies which are

appropriate for community contexts. Mutual Gain states that their training is a way of "*empowering organisations and communities to reconnect in the social space which lies between the state and the individual*"[75]. The training sessions are facilitated by Dr Andrew Fisher, an ex-superintendent of Merseyside police force[76]. The training was delivered to approximately 20 neighbourhood police officers and PCSO's from Elswick and Byker as a pilot programme for Northumbria Police to understand if the alternative approach would be suitable. Training provided by Mutual Gain consisted of approximately three full day-sessions which comprised; the first session consists of background context for the world cafe methodology and how a world cafe works in a police-community setting. The second session highlights how data analysis is done and how findings and insights are generated, with the final session dedicated to working with officers and PCSO's to organise their own world cafe event in the community. After the final training session, attendees of the training were expected to put into practice what they had learnt by facilitating their own world cafe event. Due to the attendance of officer and PCSO's from two different areas, it was decided that the cohort would run two world cafe events, one in Elswick and one in Byker.

Elswick is an inner-city electoral ward located to the West of Newcastle Upon Tyne. Elswick is categorised as one of the most deprived areas in the North East (Figure 49) with a high amount of crime perceived in this area[77]. Elswick has an approximate population of 16,000.

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[75] https://www.mutualgain.org/

[76] https://sharedfuturecic.org.uk/associate/andrew-fisher/

[77] https://www.findahood.com/locations/elswick/6277038

Figure 49 E Levels of deprivation in Elswick from 2019 Multiple Deprivation Index (Ministry of Housing Communities and Local Government, 2019)

The Elswick event, dubbed 'Embrace Elswick', took place on the 7th September 2017. In total, 49 Members of the Elswick community attended the world cafe event with facilitators made up of Northumbria Police officers and PCOS's supported by members of Newcastle City Council and other partner agencies such as Your Homes Newcastle. The event accumulated over 900 pieces of written data which were summarised in a final report document. The three questions asked to the Elswick community at the world cafe were "*What does community mean to you?*", "*What does trust mean to you?"* and "*How could you make Elswick better?"*.

Byker is an inner-city electoral ward similar to Elswick however, it is located to the East of Newcastle Upon Tyne. Byker's level of measured deprivation is on-par with Elswick (Figure 50) with an approximate population of 12,000 residents. The area is typically characterised by the Byker Wall[78] which is a long continuous tall wall made up of 620 flats. Byker is also perceived to be an area with a high amount of criminal activity[79].

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[78] http://architectuul.com/architecture/byker-wall
[79] https://www.findahood.com/locations/southheaton/6277027

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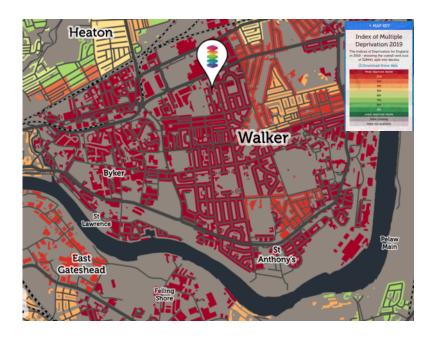
Figure 50 Levels of deprivation in Byker from 2019 Multiple Deprivation Index (Ministry of Housing Communities and Local Government, 2019)

The Byker event, dubbed 'Brighter Byker', took place on the 27th September 2017. The world cafe event attracted a total of 65 members of the Byker community and was hosted by Northumbria Police officers and PCOS's supported by members of Newcastle City Council and other partner agencies such as Your Homes Newcastle. The event posed the following three questions to residents of the area, *"What is it like to live in this community?"*, *"What could a Brighter Byker look like?"* and *"What could you do to make Byker Brighter?"*. A total of 800 pieces of written data were recorded which were summarised in a final report document written by the Byker neighbourhood police team (for the full report, see appendix item 11.3). Both the Byker and Elswick world cafe events each had a follow up event that only allowed those who participated in the original world cafe event to attend. I attended both follow-up events; Byker took place in late October 2017 with the Elswick's follow up taking place in late December 2017. At this stage, I took observational notes to understand how the follow up events were configured.

I had joined Northumbria Police in 2016 but only became aware of the world cafe initiative after both the Elswick and Byker world cafe events had taken place in October 2017.

As a Special Constable at the time, I initially became aware of the world cafe initiative through my mentor *P2,* who was a territorial police officer part of the Elswick neighbourhood team. *P2* had received training from Mutual Gain, as well as being involved in both the Elswick and Byker world cafe events in September. The topic of the world cafe initiative came about through a discussion I had with *P2* surrounding data analysis techniques that I was currently working on. This conversation had promoted *P2* to disclose that he had been given the task of analysing the tablecloth data which had been generated as a result of the world cafe in Elswick. *P2* explained that they were unsure how to begin analysing the data, which consisted solely of words, and that they would appreciate help from me. After a week, I was provided with the raw data from the Elswick event by *P2*, and this began my involvement with Northumbria Police's world cafe initiative from this point. I was referred to *PM1* who took a keen interest in having me come onboard with the initiative, with an initial view of teaching other territorial officer and PCSO's about how qualitative data could be analysed. Later, *PM1* then commissioned Open Lab, Newcastle University, to design a bespoke training package intended for territorial police officers and PCSO's that was tailored specifically for the North East.

As part of the planning stage of the initial action research cycle, I began to gather as much information as I could about the world cafe training that been issued to police staff by Mutual Gain, data which had been generated from the Elswick event as well as getting access to the Byker world cafe data and subsequent report of findings which had already been generated by the Byker neighbourhood community team. Each world cafe event also had a follow-up event where the findings from the world cafe were relayed to members of the community and a plan was also outlined by Police and other representatives. I attended both follow-up events and took observational notes. The information gathered was analysed and evaluated to critically reflect on how the world cafe process worked, as well as what the advantages and disadvantages of the initiative were. This evaluation led me to a number of

design requirements for the world cafe training package which I later designed as part of the next stage in my action research approach.

6.5.3) Act. World café design and deployment

Design of the world cafe training material began in November 2017 in lead up to a training event which had been planned by Northumbria Police stakeholders (*PM1 and others*) that was due to take place in February 2018. Throughout the design period leading up to the training event, a prototyping methodology (Stolterman, 2008) had been applied to iteratively learn, build and adapt the training material and plan how it would later apply when used in a physical training session with stakeholders. The training material that had been designed was predominantly based on structure of the material provided by Mutual Gain however, it was specifically adapted towards how it would apply in the borough of Gateshead. As part of the world cafe initiative led by Northumbria Police, *PM1* had outlined four geographic locations in the borough of Gateshead which would serve as part of a pilot initiative to see whether the world cafe approach would work, and how it would scale. By this point, Northumbria Police had dubbed the world cafe initiative as 'Operation Perceptions'. *PM1's* longer-term intentions for the world cafe, should it prove to be a success in the borough of Gateshead, were it to scale, so that it can later be applied to other areas of the North East.

The training event was held in February 2018 at Gateshead's Dryden Centre[80] and was attended by approximately 40 people. The training event was made mandatory to attend for police officers as it formed a part of Operation Perceptions. Of those 40 people, there were 26 police officers of varying ranks and authority from different areas of Gateshead itself, as well as representatives from Gateshead Council and partnering organisations, such as the Gateshead Housing Association, Changing Lives, St Chad's Community Project and Gateshead Fire

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[80] https://www.gateshead.gov.uk/article/6714/Training-venue-the-Dryden-Centre

Service. The training event set out to teach the various representatives from Gateshead how a world cafe community event would be run, and where the events would take place. During the training event, I was the facilitator in the role of a researcher, rather than Special Constable. I made note of my observations and experiences from interacting with participants post event.

The four areas outlined as part of Operation Perceptions included: Beacon Lough East, Bensham, Chopwell and Birtley. Northumbria Police chose these four locations because they perceived the communities to be 'hard to engage with' due to a combination of underlying trust issues and intra-community tensions. Police believed the world cafe events would be a productive way of 'unwrapping tensions' surrounding these underlying issues whilst exploring community aspirations for the area, as well as looking to identify how other agencies and organisations (such as Gateshead Council) could better direct their resources into these communities. Naturally, other police officers located in other areas of the North East became aware of the world cafe initiative which was due to take place in Gateshead. This action research 'act' stage consists of two community world cafe events: one event run in Beacon Lough East as the first event as part of Operation Perceptions, and an event in Meadow Well, North Shields.
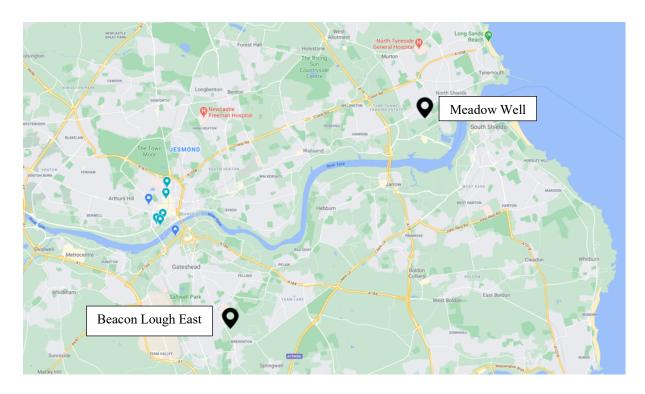
Figure 51 Location of Beacon Lough East and Meadow Well, North East England

Meadow Well is an area located close to North Shields and has an approximate population of 11,000 people. Meadow Well is an area of severe deprivation with a very public and traumatic history of tension with Northumbria Police. In September 1991, Meadow Well was at the centre of rioting which had been triggered by the deaths of two local youths after they crashed a stolen car whilst being chased by local police. There were already tensions in the community prior to 1991, with police considering it a 'no-go zone' with this incident providing the final straw for the Meadow Well community. Shops were looted, buildings and cars were set on fire and mass vandalism took place in the area[81]. On the 12th March 2018, the 'My Meadow Well' world cafe event was held at the Cedarwood Trust, North Shields. The event was attended by 42 residents of the Meadow Well community. The facilitators of the event were Northumbria Police supported by representatives from North Tyneside Council. Full detail from the event can be found in appendix item 11.4). The Meadow Well follow-up event was held at the Meadow Well Connected Hub, North Shields approximately on the 26th

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[81] https://www.chroniclelive.co.uk/news/north-east-news/meadow-well-riots-25-years-11848759

April 2018. This event attracted 32 members of the community back (76% of the original participation). The event was hosted by Northumbria Police officers with representatives from North Tyneside Council.
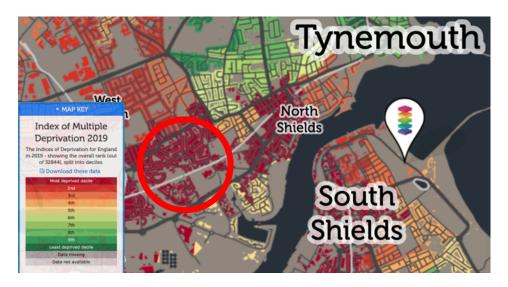
*Figure 52 Meadow Well, North Shields. Circled area where world cafe event took place. Level of deprivation as measured by 2019 Multiple Deprivation Index* (Ministry of Housing Communities and Local Government, 2019)

Beacon Lough East is located at the highest point in Gateshead, between Sheriff Hill and Wrekenton. The area is marked as being one of the most deprived in the country. The event, dubbed as the 'Best of Beacon Lough East', was held at Larkspur Community Primary School, Gateshead on Wednesday the 28th March 2018. The event was attended by 56 members of the Beacon Lough East community and facilitated by *PM2* as the Neighbourhood Inspector for this particular area. The facilitators of the event were Northumbria Police who were supported by members of Gateshead Council and Gateshead Housing Company. Full detail from the event can be found in appendix item 11.5). The Beacon Lough East follow-up event was held at Larkspur Community Primary School, Gateshead approximately one month after the world cafe event on the 28th April 2018. This event attracted 51 members of the community back (91% of the original participation). The event was hosted by Northumbria Police officers with representatives from Gateshead Council and Gateshead Housing Association.
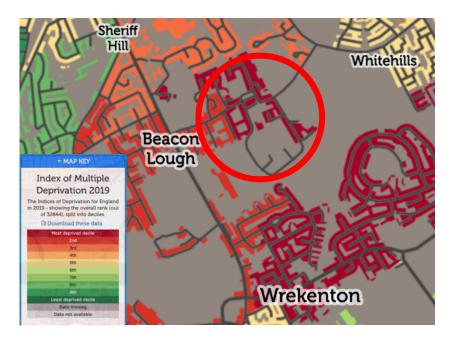
Figure 53 Beacon Lough East, Gateshead. Circled area where world cafe event took place. Level of deprivation as measured by 2019 Multiple Deprivation Index (Ministry of Housing Communities and Local Government, 2019)

In summary, the act stage of the first action research cycle consists of the design of world cafe training material which was then used in a training event which was run for 40 participants in February 2018. Police officers who attended the training event then went on to organise and run a world cafe community event in Meadow Well and Beacon Lough East (as part of the planned events from Operation Perceptions). Figure 54 provides a timeline overview of the deployments which have taken place as part of this cycle.
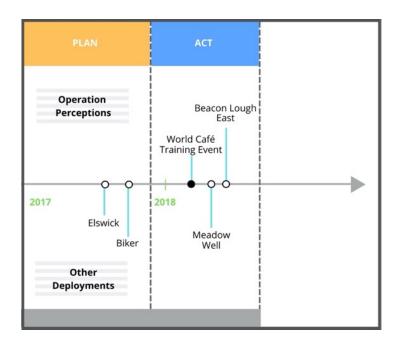
Figure 54 A summary of deployments and training events which took place as part of the first initial Action research cycle for case study 2.

6.5.4) Reflect. World café Reflection

After the first two initial world cafe events had been run, one in Meadow Well and one as part of Northumbria Police's community engagement initiative in Beacon Lough East, there was a short period of reflection. As part of the world cafe process, each event generated a finding report which was constructed by applying thematic analysis to the original community data collected from tablecloths. The Meadow Well event generated 17 themes across three question rounds, whilst the Beacon Lough East event generated 10 themes. The themes were grouped for each event and a summary of those themes were generated resulting in 3 core themes for each event. The reflection was based on the 3 core themes which had come out of the first two world cafe events, as made visible through the reports (see 11.4) and 11.5).). The purpose of the reflection at this stage was to evaluate what had gone well, what could be improved and understand what the implications of the findings were for police and partners to follow through with adequate support. The reflection took place in April 2018 and helped to further understand where and how further refinements could be made to the world cafe training material.

Similarly, feedback which had been collected from the initial training event in February 2018 was being taken into consideration to better understand the needs of police officers and take account of their comments and suggestions.

6.5.5) Plan. Matched crowdsourcing and refining the world café

Following the reflection of the world cafe training material, training event and two initial police led world cafe events in the Meadow Well and Beacon Lough community, plans were quickly established to make adjustments. At this stage in, in late April 2018, there were no plans in place for a follow up training event on the horizon, however the lessons learnt from the first action research cycle were applied to the training material and structure of the physical training, should another session be run in the future. A second training session for Northumbria police officers, Sunderland City council and partner organisations was eventually established in early 2019 ahead of two world cafe events that took place in Roker and Ryhope (more about these two events in 6.5.6)). During the time of reflection on the Meadow Well and Beacon Lough world cafe events, it was recognised that that many of the issues and outcomes communities were requesting could not be easily fulfilled due to either a lack of financial capacity or access to and knowledge of how to acquire funding. For example, one outcome from a world cafe event highlighted that communities were eager to address the amount of rubbish and general litter in the area. A way of overcoming this was to organise a community litter pick, however the individuals who wanted to do this had no equipment (rubbish grabbers, bin bags or protective equipment).

Rather opportunistically at the same time as this study was underway, SpaceHive[82] (a social enterprise) had successfully pitched itself as a platform for civic crowdfunding as part of the Urban Living Partnership (ULP)[83] based in Newcastle Upon Tyne. As part of the ULP,

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[82] https://www.spacehive.com/
[83] https://tinyurl.com/UrbanLivingPartnership

a subscription has been bought for the use of SpaceHive's matched-crowdfunding platform. Whilst other platforms exist (JustGiving[84] and GoFundMe[85], for example) it made sense to utilise the SpaceHive platform seeing as the ULP had access to it and because it presented a far greater opportunity for communities to engage with it due to the added support provided by SpaceHive as part of the package that had been purchased. Open Lab alongside Gateshead City Council, Newcastle Council and Newcastle City Futures cumulatively put forward a total of £60,000 pounds towards the funding of civic projects across the North East.

6.5.6) Act. Police intervention design and deployment

Open Lab's fund (totalling £15,000 pounds) was used as a bolt-on incentive for the world cafe training material. The financial aid was intended to be used by community members to enable them to take outcomes of the world cafe event's forward with financial incentive and backing. By adding SpaceHive to the world cafe process as a separate round at the end of a community event, the world cafe process had been adapted to foster micro projects that directly addressed the outcomes of world cafe events themselves. Micro projects were allocated an arbitrary maximum value of £1,000 pounds. Therefore, a micro-project was eligible to receive up to £500 pounds in matched crowdfunding, an amount that could also be lower depending on the cost implications of the findings and how it needed configuring to address the community's idea for a project. For world cafe events which were still due to take place as part of Operation Perceptions (Bensham, Chopwell and Birtley), Northumbria Police were informed of the matched-crowdfunding bolt-on and it was integrated as part of these future events as an ad-hoc addition to provide financial capacity.

The world cafe events which followed took place in Bensham, Chopwell and Birtley in 2018. Bensham is located in the borough of Gateshead and is located approximately 2 miles

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[84] https://www.justgiving.com
[85] https://www.gofundme.com

from Newcastle Upon Tyne and has an approximate population of 11,000 people. Bensham is categorised as one of the most deprived areas in the United Kingdom (Figure 55). A large proportion of properties in Bensham are used for short-term lets, which results in a very transient community.
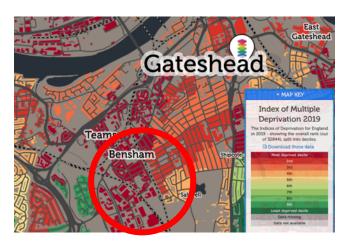

Figure 55 Bensham, Gateshead. Circled area where world cafe event took place. Level of deprivation as measured by 2019 Multiple Deprivation Index (Ministry of Housing Communities and Local Government, 2019)

The Bensham world cafe event, dubbed the 'Best of Bensham', was held in Gateshead Leisure Centre, Gateshead on Thursday the 10th May 2018. The event was hosted by *PM3* as the local neighbourhood inspector and attended by 34 members of the Bensham community. Northumbria Police facilitated the event supported by members of Gateshead Council, Gateshead Housing Company and a selection of small independent registered charities ('Love Your Avenues' and St Chads Church). Full details from the event can be found in appendix item 11.6). The Bensham follow-up event was held at the Gateshead Leisure on the 5th July 2018. This event attracted 16 members of the community back (47% of the original participation). The event was hosted by Northumbria Police officers with representatives from Gateshead Council and Gateshead Housing Association.

Chopwell is a village located in the western area of the borough of Gateshead and has an approximate population of 10,000 people. Chopwell is traditionally an area of mass coal mining and was nicknamed "Little Moscow" because there was strong support the Communist

Party. In 2017, the area was marked as being in severe tension with local Northumbria Police officers due to the re-homing of a prolific paedophile into the Chopwell community. Similarly, to Bensham, Chopwell is also marked as having one of the highest levels of deprivation throughout the United Kingdom (Figure 56). The Chopwell world cafe event was held at the Chopwell Community Centre, Gateshead, on Wednesday the 4th July 2018. The event was attended by approximately 45 members of the Chopwell community. The facilitators of the event were Northumbria Police who were supported by members of Gateshead Council and Gateshead Housing Association. Full detail from the event can be found in appendix item 11.7). The Chopwell follow-up event was held at Chopwell Community Centre, Gateshead on the 30th August 2018. This event attracted less than 40% of the members from the world café. The event was hosted by Northumbria Police officers with representatives from Gateshead Council and Gateshead Housing Association.
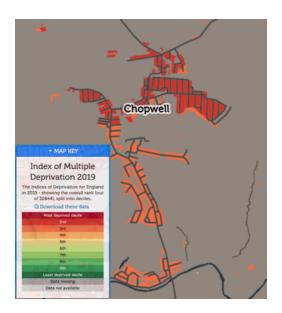
Figure 56 Chopwell, West Gateshead. Level of deprivation as measured by 2019 Multiple Deprivation Index (Ministry of Housing Communities and Local Government, 2019)

Birtley is a town located in South Gateshead with an approximate population of 10,000 people. Birtley is a site where there has been a heavy coal mining that started as far back as1351. Most areas of Birtley are not categorised as being deprived, however the northern tip of Birtley is noted as being one of the most deprived areas in the United Kingdom (Figure 57).

The 'Best of Birtley' world cafe event was held in Birtley Community Centre, Gateshead on Thursday the 27th September 2018. The event was attended by 48 members of the Birtley community. The facilitators of the event were Northumbria Police who were supported by members of Gateshead Council and Gateshead Housing Company. Full detail from the event can be found in appendix item 11.8). The Birtley follow-up event was held at the Birtley Community Centre on the 17th October 2018. This event attracted 27 members of the community back (56% of the original participation). The event was hosted by a small cohort of residents from Birtley who had previously attended the world cafe. Representatives from Gateshead Council, Gateshead Housing Association, Northumbria Police and Keelman Homes (not-for-profit Gateshead based housing charity) were in attendance but the event itself was facilitated by local resident's from Birtley's resident association.
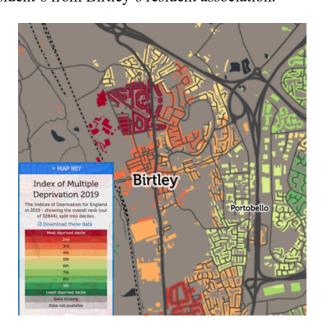
Figure 57 Birtley, South Gateshead. Level of deprivation as measured by 2019 Multiple Deprivation Index
(Ministry of Housing Communities and Local Government, 2019)

At this point, the world cafe's that had taken place in Beacon Lough East, Bensham, Chopwell and Birtley conclude Northumbria Police's Operation Perceptions which served as a pilot programme for using the world cafe approach with Gateshead based communities. Naturally, other neighbourhood teams heard about the initiative and wanted to try it for

themselves. The next year, in March 2019, I facilitated a second training session with members of Northumbria Police's CET (6.3)) in the southern area command (Sunderland) for approximately 37 police officers, representatives of local organisations including Tesco Community Support, The Salvation Army, British Red Cross, Foundation of Light, Sunderland City Council, Gentoo and Sunderland Community Action Group. This training event encompassed some more subtle changes which had been made based on the reflection conducted after Beacon Lough East and Meadow Well's events (as outlined in 6.5.4)). The major change of this training event was the addition of matched crowdfunding, which was baked into the world cafe training material, with further written templated guidance. Observational notes of significant events were recorded as part of this training event.

Two more world cafe events took place following the second training event in southern area command, these were in Roker and Ryhope. Roker is located next to the coast and is a popular tourist resort and more affluent area of Sunderland, North East of England. However, areas of Roker closer to Sunderland's city centre are measured as being highly deprived (Figure 58). The broader area has an approximate population of 5,000 people with a higher-than-average mean age of 40.4 [86].

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[86] https://www.ilivehere.co.uk/statistics-roker-sunderland-32633.html
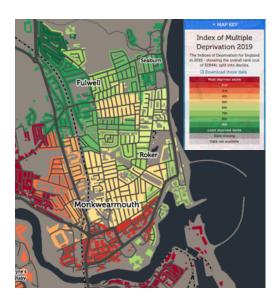
Figure 58 Roker, Sunderland. Level of deprivation as measured by 2019 Multiple Deprivation Index (Ministry of Housing Communities and Local Government, 2019).

The Roker world cafe event was held at the Dame Dorothy Primary School located in Sunderland on the 26th June 2019. The event was hosted by *P4* as the acting neighbourhood sergeant for the area and attended by approximately 38 members of the Roker community. The facilitators of the event were Northumbria Police who were supported by members of Sunderland Council, British Red Cross, Foundation of Light, Gentoo, The Salvation Army and Sunderland Community Action Group. Full detail from the event can be found in appendix item 11.9). The Roker follow-up event was held at the Dame Dorothy Primary School in Sunderland on the 27th July 2019. This event was attended by 17 residents of the community. The follow up event was hosted by Northumbria Police officers with representatives from Sunderland Council, Foundation of Light and the British Red Cross.

Ryhope is another coastal village situated south of the Sunderland in North East England with an approximate population of 14,000 people and mixed high-ranging levels of deprivation (Figure 59).

Figure 59 Ryhope, Sunderland. Level of deprivation as measured by 2019 Multiple Deprivation Index (Ministry of Housing Communities and Local Government, 2019).

The Ryhope world cafe event was held at the St Pauls Church of England School in Sunderland on the 27th June 2019. Unlike other world cafés that engage adults from the community, this event uniquely focused on engaging young people aged between 11 and 14. The facilitators of the event were Northumbria Police who were supported by teaching staff at St Pauls school. There was no follow up event for this particular world cafe.

In total, five world cafe events were run as part of this stage of the action research cycle (Figure 60). During all of the five world cafe's which took place as part of this action research stage, data was collected in a variety of ways. Police officers from each event collated community data on a round by round basis and compiled it into spreadsheets where they would later code each piece of data, as part of thematic analysis (Hayes, 2011). Police officers, with my assistance, then compiled an evaluation of the community data into a report which was presented at each of the follow up events for each world cafe. I made ethnographic notes throughout the process of engaging with police officers when helping them compile reports. I retained a copy of the community data and world cafe reports, as well as making my own observational and ethnographic notes from each world cafe and follow up. At each event I would also take pictures which would serve as material for the reports, but also as a useful visual reminder of the events themselves.

6.5.7) Reflect. Matched crowdfunding

The reflection period took place between July 2019 and November 2019 and consisted of a cross analysis of the compiled data from the Bensham, Chopwell, Birtley, Roker and Ryhope world cafe reports. This included examining the outcomes of the world cafe reports, as well as the plans and action that had been outlined as part of the follow up events. Any feedback which had been gathered as part of an event evaluation, my own observational and ethnographic notes were also taken into account as part of this reflection process. In addition, five semi-structured one-to-one interviews were conducted with police officers; three interviews were held with senior management who were ranked Sergeant and above (*PM2, PM3 and P4)* with the addition of two interviews held with police officers who were of rank lower than Sergeant (*P2 and P3). P2* and *P3* are both neighbourhood police officers who work on Northumbria Police's CET and have helped in the facilitation of many world cafe's throughout both action research cycles. The purpose of the interviews was to try and understand the value police officers saw in the world cafe approach and to better comprehend their own perceptions of how the world cafe's work with current policing strategies.

As a part of the reflection process, I used the online platform Google Classroom[87] to re-configure elements of the training material and transfer it onto an online medium. The transfer of the training material onto an online platform serves as an artifact of the reflection that took place during this stage of the action research cycle. It aims to offer insight into how a world cafe training programme could be scaled as an integrated training mechanism, so that it could be longitudinally utilised by police officers as an integral part of policing practice which is configured to current policing culture and routine. I use the Google Classroom training course as an artifact for further reflection.

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[87] https://edu.google.com/intl/en_uk/products/classroom/

6.6) Chapter summary
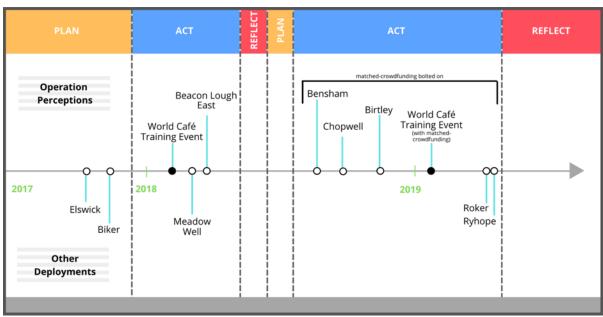
Figure 60 A timeline overview of the two Action Research Cycles and the activities and events which took place as part of each stage during the second case study.

This chapter has outlined the methods which have been applied as part of working with police officers and members of the community in case study two. The research method applied here was action research with this case study consisting of two full action research cycles (Figure 60). These cycles encompass two world cafe training sessions for police officers and partners, 7 individual world cafe community events facilitated by police officers with help of partner organisations, as well as six follow up events. This case study began in late 2017 (Table 4) whilst I was a serving Special Constable with Northumbria police where I became involved with the analysis of community qualitative data which had been generated as part of a test world cafe event run by officers in Elswick, Newcastle Upon Tyne. The case study concluded in late summer of 2019 with the final community world cafe event taking place in Ryhope, Sunderland.

world cafe	Date	Community Attendees	Appendix item	Follow Up	Attendees
Elswick	07/09/17	49	11.2)	20/10/17	Not logged
Byker	27/09/17	65	11.3)	21/12/17	7

Meadow Well	12/03/18	42	11.4)	26/04/18	32
Beacon Lough East	28/03/18	56	11.5)	28/04/18	51
Bensham	10/05/18	34	11.6)	05/06/18	16
Chopwell	04/07/18	45	11.7)	30/08/18	18
Birtley	27/09/18	48	11.8)	17/10/18	27
Roker	26/06/19	38	11.9)	27/07/19	17
Ryhope	27/06/19	40	Not available	No follow-up	Not logged

Table 4 Summary overview of all World Cafe Events across both action research cycles, highlighting event date, attendees, link to full report in appendix and information on follow-up event.

7) Design and Approach for the World Café

The first cycle of action research spans the time period of late 2017 to early 2018. At the end of 2017, Northumbria Police hosted two separate world café events with the communities of Elswick and Byker. As part of my initial planning, I reflect on the first two police run event's and conduct an evaluation of the Mutual Gain training to form my evaluation which is then used to plan and design a more purpose-built world café training package for Northumbria Police. As part of this planning process, I try to understand and unpick why Northumbria Police are interested in conducting engagement in this way, unpick what they hoped to achieve, and where and how I fit into this process. In early 2018, I construct the first version of a world café training package and deliver it as an in-person training event for officers and partner agencies. Police officers, now operating on the guidance of my training material, commence the facilitation of two world café events in spring of 2018 in Meadow Well and Beacon Lough East (6.5.3). I later reflect on my experience of conducting the training with officers by analysing feedback received about the event, materials and structure of the training, as well as reflecting on both world café events and their outcomes. For these events, I highlight what aspects went well and what did not go well. This initial reflection was conducted in anticipation of other world café events due to take place as part of Northumbria Police's Operation Perception initiative (see action research cycle two, outlined in chapter 3.3).

7.1) Plan. Understanding Northumbria police's approach
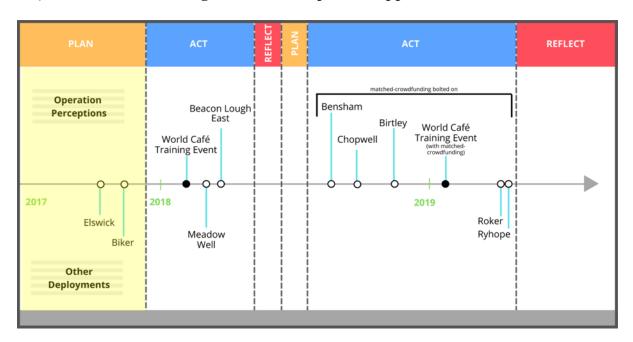
Figure 61 This stage of the case study is highlighted in yellow (Action Research 'plan' stage)

The first step as part of the planning process was to firstly understand why Northumbria Police had chosen to reach out to communities. The answer lies in a number of different factors which all have a small part to play in the build-up that influenced Northumbria Police's decision to adopt the World Cafe approach including, police strategic goals, shared organisational priorities and personal professional development. I then examine why Mutual Gain was chosen as the professional body to teach officers an alternative engagement methodology, and how the approach of Mutual Gain aligned with Northumbria Police and partners goals, and where I fit into their approach.

Operation Perceptions is a Northumbria Police initiative which was conducted in partnership with Gateshead Council and The Gateshead Housing Company. The driving motivation behind the initiative was to better understand the emerging gap between police and council derived data on Gateshead communities, and the anecdotal perceptions of people who live in Gateshead. Broadly speaking, much of the data from a police and council perspective negatively portrays the majority of communities as a 'bad' place to live with high crime and

dependency on council and other partner services (such as The Gateshead Housing Company). As part of this emerging gap, police were particularly interested to examine Anti-Social Behaviour (ASB) given the disproportionately high instances of ASB (

Figure 62) which occur across Gateshead and its on-going demand on services provided by Gateshead Council and The Gateshead Housing Company.
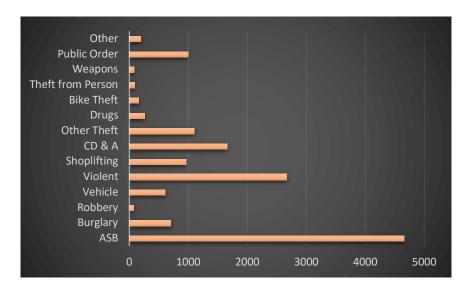
Figure 62 A graphical representation of the cross section of different types of crimes that took place in Gateshead between May 2015 and May 2017. Note the disproportionate instances of recorded Anti-social Behaviour which was recorded during this two-year period.

Northumbria Police were also aware that many of the communities they operated within Gateshead perceived officers to not be properly managing and dealing with instances of ASB with people believing it was not a policing priority. Hence, Northumbria Police rather fittingly named the initiative 'Operation Perceptions' as a cross organisation manoeuvre to address community thinking and perception about ASB.

Northumbria Police defined the strategic goal of the initiative to be a way of increasing the number of people who agree that the police and council are handling ASB and crime issues that matter to them. I first became aware of the strategic goal during a meeting which took place in November 2017, ahead of any Gateshead based community engagement events or training. The meeting was held in conjunction with representatives of Gateshead based partner

agencies, Gateshead Council and The Gateshead Housing Company and it was where I was first introduced to other organisation representatives as part of a collaborative partnership with Newcastle University. The initiative forms a smaller part of the Northumbria Police's force wide strategic objectives and priorities as set out by the Police and Crime Commissioner (PCC), Vera Baird[88]. There was no long-term plan in place for how this particular initiative should unfold, and considering the nature of policing, it strongly suggests that the engagement was not intended to continue after initial consultation with communities. The priority, for police at least, was purely to engage with communities which perceive a high level of crime (in particular, ASB), to meet the requirements of the Police and Crime Plan.

Prior to realisation of Operation Perceptions between 2016-2017, the PCC had made grant funding available to support the Police and Crime Plan objectives of 'putting victims first', 'dealing with ASB' and 'building community confidence'[89]. *PM1*, as the primary driver for Operation Perceptions in Gateshead had received funding from the PCC as part of this the wider force initiative. With that funding, *PM1* had reached out to Mutual Gain who are a training organisation that specialising in *'empowering organisations and communities to reconnect in the social space'* (Mutual Gain, 2021). Mutual Gain have a number of OCN[90] recognised training courses available which cater specifically to public engagement for policing services[91]. As specified by many funding bodies and an inherent characteristic of grant funding, there is a necessity to use available funds before they expire at the end of an allocated time period. With this in mind, *PM1* took the opportunity to buy training from Mutual Gain in the form of their world café Public Engagement course[92] so that funds could be used, but also because *PM1* understood, as a senior officer, the drawbacks of current engagement strategies

[88] https://victimscommissioner.org.uk/dame-vera-baird-qc-champion-for-change/
[89] http://www.northumbria-pcc.gov.uk/police-crime-plan/commissioning-services-grants/2016-2017/
[90] https://www.ocnlondon.org.uk/Training-Events/Training-and-Development
[91] https://www.mutualgain.org/training/
[92] https://www.mutualgain.org/training/world-cafe/

(PACT and 'Cuppa with a Copper') and their appropriateness for engaging communities in a more meaningful way. The world café training available through Mutual Gain is a standalone course solely designed to offer insight into how the methodology can be used for public engagement and is delivered as part of the service to be adaptable to fit to an organisation (Northumbria Police's) strategic goal. The training does not consider longer-term engagement, or what should be done as a 'next step', however, given that Mutual Gain offers a more comprehensive training course centered on community capacity building[93], that this would have been a logical next step offered to Northumbria Police to purchase.

Given the scope of the initiative, it is clear that it is was essentially an order to follow for PM1, and that it would constitute a tick-box type exercise for engaging with communities around a specific topic. There were no longer-term plans in mind for what would necessarily happen past any engagement that took place; however, this is where I believe I fit in. *PM1* grasped the opportunity to collaborate with me (as a representative of Newcastle University) because it provided short-term relief for officers struggling to complete data analysis of the Elswick world café. However, through further dialogue which took place on 2nd November 2017 between *PM1* and Open Lab's director, longer-term prospects for engaging with communities were realised. This centered around my creation and delivery of a training programme adopted from Mutual Gain's World Cafe training as a bespoke package for Northumbria Police officers, ahead of Operation Perceptions. *PM1*, as a senior officer, was also aware of their own professional development and how such initiatives, such as Operation Perceptions, could benefit their own personal portfolio of achievements, especially if a large local university is collaborating as part of the process. However, this is not to say that my involvement with Operation Perceptions was solely because I was a bridge for collaboration, but also because having academic funded backing could only increase the changes of

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[93] https://www.mutualgain.org/training/ocn-accreditation/

longitudinal success for the initiative, as well as alleviating any financial requirement to continue with Mutual Gain. A record of a PCC meeting held on the 8th February 2018[94] clearly states an agreement had been made for Open Lab to create and train officers and that because additional links had been made with Open Lab, there was no need for further commissioned services from Mutual Gain. As an asset for Northumbria Police, I represented excellent value for money given my position as a postgraduate student who is paid for through EPSRC[95], but also as a volunteer Special Constable (at no cost) which afforded me the opportunity to conduct work seamlessly as an integral part of Northumbria Police and the Perceptions initiative.

7.1.1) Understanding the pilot world café events, outcomes and follow-ups

I became involved in the Elswick event evaluation in late 2017 after the community police led community event had already taken place. My approach to the analysis of the Elswick world café saw me utilise thematic analysis for each of the three rounds of harvested tablecloth data. All three rounds together formed 299 individual codes which resulted in a total of 12 distinct themes which can be viewed in full in appendix item 11.2).

Round	Codes Generated	Themes Generated
1	96	3
2	81	5
3	122	4

Table 5: Elswick data analysis: codes and themes

A report template was constructed which included background information on the Elswick community, the world café event itself as well as how the analysis was carried out. This was inserted partly to contextualise the report findings, but also ensure the report was transparent seeing as it was going to be released to the public. The report also included photos taken from the event as well as quotations sourced from the original data harvest. The final

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[94] http://www.northumbria-pcc.gov.uk/v2/wp-content/uploads/2014/08/8th-February-2018.pdf
[95] https://epsrc.ukri.org/

report was handed to officers who had attended the event to confirm accuracy of my analysis, given that I had not attended the world café community event; this process also helped with proof reading. After, the report was presented to a panel of senior police officers who were responsible for overseeing the Elswick area. The full Elswick report can be found in appendix item 11.2). Whilst I did not attend the Byker world café event, I did obtain access to the public report which was constructed by Byker neighbourhood officers (see item 11.3)). The Elswick world café report concluded three distinct reoccurring themes which can be summarised as a lack of youth and meeting facilities, environmental issues and anti-social behaviour related problems. The Byker event report had great similarities with the Elswick outcomes as it highlighted community concerns about the environment, recreational activities, anti-social behaviour and social integration.

Both pilot world café events each had a follow up event which was held with members of the community who had originally attended the respective World Cafe. I attended both follow-up events so that I could witness how officers and representatives from partners agencies conduct themselves at the follow up. From both follow-up events, I combine my remarks and structure them into three separate interesting observational areas which provide insight into the preparation and planning of the follow-up events, how they were police-led and some reflection on the reporting of world café outcomes.

Evidently, the Byker and Elswick follow-up events did not have a concrete plan in place for how they would unfold. I approached one attending neighbourhood officer at the Elswick event who noted *"we are just going to wing it and see what happens"*. Similarly, there was no apparent format or structure applied to the follow-up event which would be in stark contrast to how the world café's had been run. Both follow-up events were held in different community venues than the original world café which was also a little jarring as it would have meant some community members would have to travel further. Consequently, both events quickly turned

into a venue for heated debate where attending residents took it as a further opportunity to speak more openly with police, despite the seemingly low community attendance. The Byker event attracted seven residents, whilst Elswick attracted ten: numbers which highly contrasted against the original world café attendance and struck me as a lack of continued interest from residents. However, I note that the Byker follow-up event also took place over two full months after the original community event. When asked in conversation, one resident stated that they had only found out about the follow-up event through a local police officer who had been assisting them with a separate matter.

Police officers were facilitating the follow-up event however, it became clear, particularly at the Byker follow-up event, that they were attempting to answer questions relating to matters that were out of their control. For example, issues of waste management and pest control. Ideally, these issues would have had a representative from the local council or another partner agency to comment. Officers simply stated that there had been a problem raised and that it would be followed up appropriately with the proper organisation (i.e., the council or partner agency responsible). The impression the event gave was that police were managing the outcomes of the world café thereby following up with the representatives of partner organisations themselves, in order to address problems and issues that had been outlined. However, in reality given the lack of capacity of neighbourhood police officers, this does not appear to be a realistic or scalable decision for how follow-up action is implemented. Similarly, any follow-up actions undertaken by officers with partner organisations would still have a high possibility of ending with no actionable outcome due to the fluctuations in officer working patterns, internal transfers and nature of the role where officers. For example, the host of the Byker world café event and its follow-up event was the Neighbourhood Inspector, however, shortly after the follow-up event they were transferred which resulted in no further follow up action, consultation or outcome for the Byker community. It was not the priority of the newly

appointed inspector for Byker to continue pursuing the outcomes of the world café event, so it went no further. The apparent abandonment of responsibility towards the Byker world café and its community demonstrated that there was no real accountability or plan for continuing to engage with the community about their issues. *PM1*, as senior police management overseeing the initiative, noted that there was in fact a lack of directed pressure to pursue the initiative at the time.

Mutual Gain, as the world café trainers for officers, had not provided any notes or guidance on how officers should proceed with analysing or making sense of the world café results. One neighbourhood officer (*P1*) noted that the findings, comprising heavily of qualitative data, were "*simply overwhelming. We don't have the time or knowledge to make sense of this…*". It was demonstrably clear that officers were reluctant to engage with the analysis of data to the depth that was required, which left officers uncomfortable with the task of analysing outcomes. This inherent skills gap was also noted when the Elswick world café data harvest was eagerly passed over to me for the purposes of compiling the Elswick world café report. The officers of Byker NPT had compiled their own findings report however the conclusions presented were somewhat unclear which was caused by a number of officers summarising subsections of data and hastily amalgamating it into a single document. Despite both world café events producing final reports, the reports themselves were not initially made publicly available and remained as an internal police report. Similarly, the method in which the Byker event data was managed and analysed lacked transparency in its method which was not made visible to the public. This potentially meant that police could, in theory, purposefully miss out information from the world café report and the communities would be none the wiser.

7.1.2) Evaluating the pilot world café training strategy

I sought to gain an understanding of the training that Northumbria Police had received from Mutual Gain earlier in 2017. My evaluation of the Mutual Gain training material took place in

December 2017 so that I could understand what it had done well and what could be improved, now with the understand of how the world café events ran and their outcomes. The evaluation of the Mutual Gain training material and training process is used to form new requirements for the design and development of a Northumbria Police specific world café training package.

The Mutual Gain training was evaluated by considering its benefits and drawbacks. The following table provides a summary overview of the evaluation which took place in late December 2017 (Table 6).

Mutual Gain: Training	
Benefits	**Drawbacks**
Accreditation: The training was accredited and counted towards officers continued professional development.	*Upskilling:* The materials made available to help officers draw themes from harvested world café data were not comprehensive enough to give officers a clear understanding of the process which left them feeling unsure about this stage of the analysis.
Upskilling: The training provided officers with a comprehensive overview of the world café methodology, how it works as well as how to design an event.	*Accessibility:* All materials provided were paper based with digital copies made available through email chain. Materials were distributed through the police chain of command which resulted in administrative errors where some officers were not updated about important changes or information during the learning process (*P1*).
Experience: The training was provided by an ex-police officer with over 25-year experience. This helped contextualise the application of the training for other police officers and provided an understanding of shared experience from colleague to colleague.	*Time restrictions:* Training time consisted of one full day followed by three half-days. Many officers could not commit to this given the time restrictions associated with their working patterns.
Support: Support was provided by Mutual Gain throughout the training and event hosting. This included hands-on support and guidance however, this support was restricted to remote consultation given Mutual Gain was not based in the North East of England.	*Prerequisites:* It was a prerequisite that police officers rely on their natural conversational skills and experience to help facilitate conversations with members of the public during world café events. It was sometimes difficult for officers to separate their role and conduct conversations with members of the public in such an informal setting. Officers did not necessarily probe members of the community effectively (as table hosts) to extract information.
	Support: Support from Mutual Gain ceased after the world café event had taken place. Therefore, support with data analysis or follow up was not provided.
	Sharing Experiences: Mutual Gain provided no mechanism for the sharing of experiences between those who had run world café events in the past, with people who had not run one before which could have proven to be a useful learning experience.
	Evaluation: There did not appear to be any mechanism for self-evaluating world café events from a policing perspective; therefore, there was no reflection on the world café process.
	Cost: The cost implications associated with the Mutual Gain training programme cost Northumbria Police £10,000 pounds, which equated to

	approximately £500 pounds per officer (20 officers in total).

Table 6: An evaluation of the benefits and drawbacks of the Mutual Gain training package provided to Northumbria Police in 2017 in preparation for the Elswick and Byker world café community events.

7.2) Planning a new world café training package

Learning from both the evaluation of the world café follow up events (Byker and Elswick) and the evaluation conducted on the Mutual Gain training programme, a framework for the structure of world café training package was established. The training was designed using a five-stage framework to provide police officers, as the main audience, with an overview of the: 1) world café methodology, 2) recruitment and incentives, 3) venue selection, 4) data collection and analysis, and 5) follow-up event management.

world café methodology: Overview of the theory behind the world café engagement approach which contained details about its purpose, etiquette, do's and don'ts and the roles involved. A small activity would follow section one's presentation which then asked participants to pick one of five data packs made available. Each data pack contained information relating to crime statistics, population and wealth about a made-up neighbourhood which would serve as an example location throughout the training event. Participants are encouraged to formulate questions that they might possibly pose if they lived in this area, and think about what questions they would ask if they were at a world café themselves. This small activity allowed participants to understand, from the perspective of a resident, how such simplified questions could extract valuable information from members of the community by sparking meaningful and productive conversations.

Recruitment and incentives: Section two outlined how residents can be recruited from particular neighbourhoods, how police should approach residents, how to pitch the community event concept to residents, the number of residents that should be approached and what information residents need to know in order to attend a world café event. This section also

included information about how incentives can be sourced locally from in the community (e.g., approaching local supermarkets, businesses etc.), how and when vouchers or other incentives should be distributed to residents as well as how and when they are physically handed over.

Venue Selection: In this section, there is emphasis placed on finding a suitable venue by indicating details such as a venue's capacity, resources and facilities (seating, tables, toilets) and location that must all be taken into account when looking to host a community world café. *Data collection and Analysis:* I expose what 'data' looks like, it's format, how it can be processed so that sense can be made of it and how to extract final outcomes from the data. Following this last section of the presentation, a small group activity took place which allowed participants to run a 'mini–world café' in groups so that they could simulate through each stage of the event. Participants are each allocated a role, either that of a 'citizen', 'café host' or 'table host'. 'Citizens' will also receive a pre-made persona which they can use as a way of simulating a resident of the practice world café. This provided participants the opportunity to run through the typical agenda of a world café in a 20-minute segment which would help participants understand how a normal event works in practice. *world café follow up:* An overview of when a follow-up event should take place, why it should take place and some suggestion of how the world café outcomes (from the data) could be addressed and acted upon by representatives from other agencies, other than the police.

7.3) Act. Deploying the world café training package
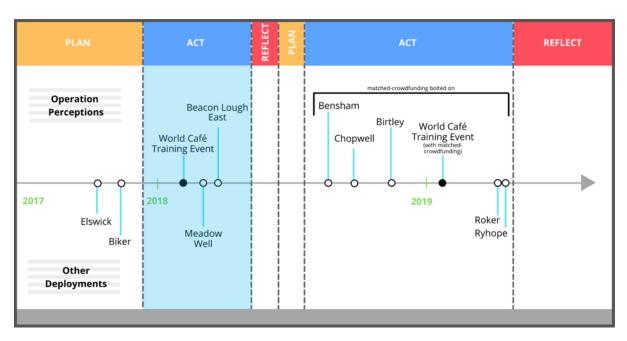
Figure 63 This stage of the case study is highlighted in blue (Action Research 'act stage)

The world café training event took place on the 22nd February 2018 and had approximately 40 participants. The materials of the training package were configured to serve as a step-by-step guide which explain how to plan, run and evaluate a world café event for communities. At this point, the training material took a physical format so that I could deliver the training in-person to people at a training event. The training material was condensed into a single day which was split up by two group activities to enable participants to better engage with the concept by working through scenarios about the world café roles, responsibilities.
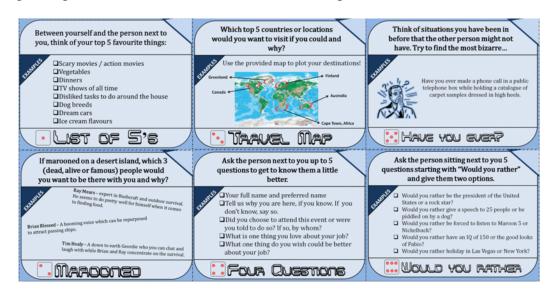
The bulk of the world café training material was structured into a presentation which provided an overview of what the general concept of a world café is, provide an introduction to the CET as the team supporting neighbourhood officers with Operation Perceptions and a session on determining outcomes from large amounts of community data. Understanding that officers or other attendees from partner agencies may not know one another, I used a series of icebreaker activity cards and dice to promote interaction (Figure 64).

Attendees of the world café event were randomly distributed amongst six tables during the training event. Each table, bar one, was made up of a mixture of police officers and other representatives (from the local council or other partner agencies). One table was solely populated by police officers who were all from the neighbourhood team at Chopwell, Gateshead. After introducing the concept of a world café to attendees, the first activity prompted each table to plan out a mini-world café event using a series of resources including personas, planning sheets and role cards (Figure 65).

Figure 65 Police officers and representatives from Gateshead Council discussing the configuration of questions for their mini–world café event as part of the scheduled activities for the training event (left). Personas and role descriptors which were designed as part of the role-play for the upcoming world café training programme with police officers (right).

The next stage of the training allowed attendees to have a practice run of a mini-world café (around each table) by adopting one of the provided personas. To support this activity, I had given each table a data pack which had information about a made-up area highlighting area's statistics on crime, housing, tensions and problems; essentially enough to get a feel for what kind of a neighbourhood it was. This activity allowed people to get insight into what it was like to go run through the world café process and ask questions or discuss approaches for how a world café may work with a community. The latter half of the training focused on data gathering, analysis and when to conduct a follow-up event. At the end of the event, attendees were invited to leave feedback reflecting on their initial thoughts about the world café approach to community engagement as well as reflect on my style of training. Following on from the training, all attendees was provided with a series of resources which reflected the content of the days training as well as additional resources such as a template and checklist for event organisers, scripts for café hosts and further information about techniques table hosts could use when in dialogue with members of the community.

7.3.1) Meadow Well and Beacon Lough East world café and follow-up events

In total, this action research cycle encompasses two world café community events which were run in quick succession after the first training event in February. These were the 'My Meadow Well' and 'Best of Beacon Lough East' events. A combined reflection on both of these events and how they unfolded is available in section 7.4)

The first world café event to run was 'My Meadow Well' and took place at the Cedarwood Trust, North Shields on Monday 12 March (Figure 66). The follow-up event was held at the Meadow Well Connected Hub, North Shields approximately on the 26th April 2018. The follow-up event attracted 32 members of the community back (76% of the original participants) and was hosted by Northumbria Police officers with representatives from North Tyneside Council. The main outcomes of the event hinged on three main topics; 'clean and

safer environment', 'better communication engagement and promotion' and 'a lack of facilities and things to do for youth'. In total, over 700 comments had been collected across the three rounds of questioning which generated approximately 452 thematic codes. The analysis was conducted by a small group of neighbourhood police officers from North Tyneside with support and guidance from myself. For a full overview of the report and findings, please see item 11.4), with my reflection on the event in section 7.4)

Figure 66 Top-left, members of the Meadow Well community noting responses to the first question of the event. Top-right, highlighting the layout of the tables and small number of community members at a single table. Bottom-left, community members noting down responses to the second question at the event. Bottom right, a snapshot of some of the different groups of the community at the event.

The 'Best of Beacon Lough East' world café event was held at Larkspur Community Primary School, Gateshead on Wednesday the 28th March 2018 (Figure 67). This event represented the first world café as part of Operation Perceptions in Gateshead. The event was attended by 56 members of the Beacon Lough East community. The facilitators of the event were Northumbria Police who were supported by members of Gateshead Council and Gateshead Housing Company. Full detail from the event can be found in appendix item 11.5)

The Beacon Lough East follow-up event was held at Larkspur Community Primary School, Gateshead approximately one month after the world café event on the 28th April 2018. This event attracted 51 members of the community back (91% of the original participation). The event was hosted by Northumbria Police officers with representatives from Gateshead Council and Gateshead Housing Association. The main outcomes of the event hinged on three main topics; 'anti-social behaviour', 'environmental issues' and 'desire for cohesion amongst residents'. In total, over 650 comments had been collected across the three rounds of questioning which generated approximately 152 thematic codes. The analysis was conducted by a small group of neighbourhood police officers from Gateshead with support and guidance from myself. For a full overview of the report and findings, please see item 11.5), with my reflection on the event in section 7.4)

Figure 67 Top-left, a snapshot of the event before it began highlighting the layout of the event. Top-right, a table-host engaging with members of the Beacon Lough East community. Bottom-left, PM1 engaging in conversation directly with residents of Beacon Lough East on policing related issues. Bottom-left, residents noting down their comments in response to question one of the world café event.

7.4) Reflect. Reflecting on progress so far
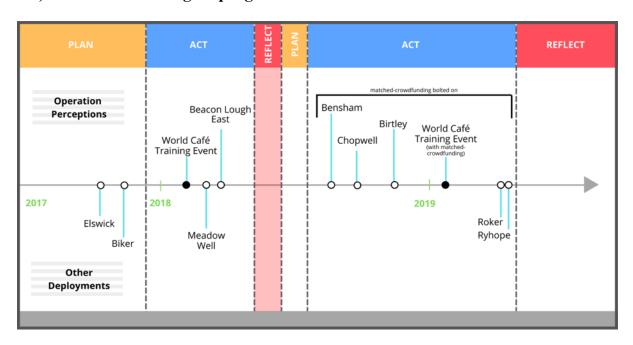
Figure 68 This stage of the case study is highlighted in red (Action Research 'reflect' stage)

The training event and first two world café's that followed serve as an important first step in the action research cycle because of the insights they provide, and what this means for the next research cycle. This reflection begins by focusing on the world café training event and then both the Meadow Well and Beacon Lough East community world café events and follow-up events.

7.4.1) Introducing police officers to the world café approach

The pilot deployment of the training material was a useful exercise to determine how the general concept of a world café and the format of training was received by police officers. The deployment provided critical insight into the structure and formatting of the training itself. Comments were collected at the end of the training event via post-it note feedback. The feedback comments were collated and grouped into themes; in total, 14 comments containing multiple items of feedback were received. I noted that all the comments left as feedback were from police officers, which is not surprising given the event was framed as training for neighbourhood police officers. In addition to the comments received from officers at the

training event, I add in my own experience from a facilitator's standpoint, as well as comments from a debrief discussion which took place straight after the training event with members of the CET.

The world café training material was considered too long with six of the 14 comments noting that it was effectively a simple concept that did not require a full day's training. Overall, the training event appeared to be enjoyed by most who attended. The content was considered easy to grasp and digest however it was strongly suggested from four of the comments received that the information being relayed could be condensed into a quick-reference format. Of the 14 comments received, all six made reference to the group activities which had taken place noting that they were arduous and not really necessary given how simple the concept of a world café was. Police officers are not always available to attend in-person training sessions due to the very nature of their role. Officers typically work different shift patterns, work across different geographic locations and are on-call even when they have scheduled breaks. Logistically, this results in coordination problems trying to get officers into the same place at the same time for a short period of time, such as two or three hours. This problem is only exacerbated by the current economic state of policing whereby the number of officers is historically low resulting in officers having to cover more areas and responsibilities than normal. Similarly, representatives of partner agencies are also under increased pressure and have similar issues attending long full-day in-person training events. Building on the point raised by participants through the post-it notes, officers from CET noted neighbourhood officers would find it difficult to sift through the material in its present format (presentation notes). The information should be made available in a sharable and condensed format for officers and representatives of partner agencies.

Six comments highlighted that there was not a lot of emphasis on the follow-up event and how this should be conducted in practice. During the latter stages of the training event, there

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was a number of questions from representatives of partner agencies asking how follow-up action might take place as a result of a world café. This did raise an important issue towards considering the sustainability of this approach, and how it may actually negatively affect community relations if there was essentially no change or improvement for the communities themselves. Interestingly, police officers simply wanted to know more about the layout of the follow-up event and when it should take place, rather than what the content of this follow-up event would be. Officers noted they would prefer to have been presented with a world café and follow-up event as a to-do list which is broken down into smaller, more manageable tasks which each had their own clear distinction, requirement and outcome. The hierarchical structure and operation in the police organisation dictate this kind of working culture of how officers are assigned tasks from their higher ranks and how they are expected to complete them; by realigning the world café training with a similar step-by-step (procedural) experience, officers will be able to engage with the material in a more familiar and appropriate way. A small number of comments directly queried what happens after the follow-up events and how local police are meant to act on the issues or aspirations expressed by the community. There was a number of general comments left which queried how material from this training session could be shared amongst their colleagues and if a condensed version was also available for distribution. In discussion with officers of the CET after the event, it was noted that officers do not necessarily have the time, nor do they have "*a long task-attention span because everything in the role of a police officer is quick and corresponds to a defined and established process*". It became clear that officers are not necessarily granted the capacity to experiment or think of new ways of carrying out their role given the demands of the job; they simply want instruction for what they have to do and what they have to achieve as part of the task.

Many officers that were receptive to the world café training and its methodology had a positive response towards how it differed to traditional engagement strategies, such as PACT.

During the event's activities, I noted responses such as: "*I mean I've got 16 years in the police and I've never been part of something like this before*". From some officers, there appeared to be a genuine appetite and enthusiasm to run community events with members of the community. However, other officers were quick to voice their dismay at the training and the approach of a world café by commenting that it was a "*soft approach*", or a "*waste of police time*" and that it should not be "*our [police] responsibility*" to do "*this kind of work*". During the training event, there was a group of six officers from Chopwell neighbourhood policing team who simply chose to outright disengage with the training event all-together at a very early stage. I recall and took note that these six officers openly mocked the approach in a group (the only group of officers to not split up and distribute themselves amongst the different tables at the event) and consequently it resulted in them receiving disciplinary measures from senior management (*PM1*) during one of the allocated coffee breaks. Comments received from the end of the event expressed similar dismay at the world café concept highlighting that it would not be an effective form of community engagement for police officers to pursue. Following this episode, the six officer's engagement tokenistically improved however, it quickly became evident there was underlying resentment towards the me as the training facilitator. In response to the situation which had unfolded, an observing officer commented "*you're bound to get that response from older cops, they're complete dinosaurs*" with another officer commenting "*all they're interested in is putting [kicking] doors in*", "*they don't understand the long-term benefits of this kind of police work, it actually makes the job easier*". The outlook of '*dinosaur cops*' contrasts against that of younger enterprising officers, hinting at a positive appetite for more audacious or experimental policing practices. The term "*dinosaur*" is commonly used to describe officers who take a traditional and principled outlook towards policing. The term characterises a stubborn and inflexibility to change or work outside the traditional boundaries of a policing role, commonly associated with older officers who have been in the role for an

extended period of time. Whilst police actions must be seen to follow set procedure in order to provide a consistent and reliable public service, the necessity for officers to work within tightly regulated boundaries and processes raises further questions over their own ability to employ more open, less regulated approaches in their day-to-day operation.

During the aforementioned situation, I noted that not only did some officers not engage with the world café concept, but the issue was not directly challenged by senior management at the time it occurred, despite several higher-ranking officers present. Senior management themselves need to understand the concept in order to fully advocate and champion it as a tool so that they can convincingly encourage their own officers to carry out world café events in the future. Discussing this event with officers from CET after the training session alluded to officers needing to know what they would gain from the training longer-term. There needed to be some kind of incentive for officers to want to engage with the training and facilitate these community events themselves, rather than solely relying on it being "*just an order*" from senior management. Perhaps better framing of the world café as a means of building trust and rapport with the community with greater emphasis on how it would benefit more traditional policing practice, such as gaining useful community intelligence. However, this would not undoubtedly be a very fine line between actively listening to a community's problems and issues, and then deceiving them into thinking that to gain intelligence.

7.4.2) Reflection on world café deployments and follow-up events

Following the training event, the first two world café community events took place in Meadow Well and then Beacon Lough East. Beacon Lough East was the first event to officially take place as part of Operation Perceptions. Both events were considered a huge success, with each one receiving overwhelmingly positive community feedback (Figure 69). From my observations, I reflect on what went well and what did not go well as part of both community world cafés and their respective follow-up event's.

Figure 69 Feedback received from both Beacon Lough East (left) and Meadow Well (right) was overwhelmingly positive with no neutral or negative comments. For the full report on each event see 11.5) and 11.4)

Ahead of the Meadow Well event, officers expressed a degree of anxiety over facilitating the event due to the local area's historical conflict between residents and police. However, despite their initial worries, community attendance was considered high (42) with residents having a notably positive attitude towards police at the event. There was not any notable tension or hostility between police and residents. The Meadow Well world café event was introduced by a member of senior police management who purposefully chose to wear full police attire, directly contravening the guidance which had been provided during the training event. The senior officer introduced the event and then handed over to her colleague, the local neighbourhood Sergeant, who was dressed in plain clothes who then proceeded to run the remainder of the event from that point on. This was significant as it had the potential to change the power dynamic in the room, given that it was intended as an informal event. Interestingly, the visual presence of an authoritative figure did not cause any conflict but instead appeared to add legitimacy to the event and served as clarification for residents that the police were taking a vested interest in the community and their area. Officers conducting the world café at Beacon

Lough East also had reservations about the method of engagement, thinking that the world café approach would maybe be too much for people to comfortably engage with.

Officers of both events believed residents would come 'armed' with issues, problems and complaints to the world café. Whilst officers understood this was a possibility, they did have reduced concern given that the format of the world café was distinctly dissimilar from a traditional PACT meeting where these kinds of negative interactions would normally take place. Officer's concerns lay with the small minority of outspoken residents who could become challenging to engage with and that if they were given the opportunity, they could potentially disrupt the event or encourage other residents to side with them. There were small instances where outspoken residents did cause minor disruption to the event however, the format and strength of the world café host's facilitation effectively 'disarmed' these individuals and allowed the Beacon Lough East event to continue unaltered. For both events, the majority of concerns surrounding resident's engagement were quickly put at ease as community members appeared attentive and openly willing to participate in all aspects of the world café whilst responding positively to the presence of police and other partner agency representatives. In the case of Beacon Lough East's event, neighbourhood officers were successful at securing a large number of £10 pound vouchers from the local Tesco supermarket. This benefitted the event as it made the task of recruiting residents relatively easy, and also implied that residents would need to demonstrate positive engagement in the world café to redeem them. Despite the number of residents who attended the event, officers had initially expressed concern as to how effective the vouchers would realistically be at attracting residents to the event, as well as to what level residents would actually engage with the activities (question rounds) knowing that they could (in theory) sit relatively quiet until the end of the event and then leave with their voucher.

Both events ran a follow-up event within a month after meeting with the community. The Meadow Well follow-up was particularly notable due to the Sergeant, who facilitated the world

café, being quick to compile the event report and distribute it amongst the various partner agencies in good time ahead of the follow-up event. This meant that partner agencies had enough time to plan their response, which they could then deliver themselves at the follow up event. Meadow Well's follow-up was particularly strong and had good partner agency support to reflect on the event outcomes and identify future actions. The event was well received by the 32 returning residents and there was no notable tension between facilitators or residents. One key benefit to conducting the follow-up in this manner was seeing how engaged partner agencies were with residents, as well as seeing how well they understood the report findings and how well they were able to address them with residents' input. However, in sharp contrast, the Beacon Lough East event follow-up was conducted in an entirely different way which caused tension and unrest. The world café repot was not completed in good time which meant partner agencies were not consulted before the follow-up, despite being asked to attend. Furthermore, a lack of forward planning meant that the original people who had attended world café from partner agencies were not present, and others had taken their place. Whilst this is not necessarily a problem in itself, the issue lay with the new representatives not being briefed about the etiquette of a world café, and how this follow-up event was intended to be an informal affair. This resulted in representatives from partner agencies reciting to residents the changes that had been already made in the local area and failing to address the community's issues raised at the world café. Residents were quick to realise this and there was a rapid build-up of unrest and anger at the panel of representatives. One resident was so disappointed that they left after declaring the whole ordeal a waste of their time. On reflection, it was also acknowledged that the physical format of the follow-up event negatively affected the social dynamics in the room. Officers, who had prepared the venue for the follow-up event, opted to host the event in a format more comparable to a traditional PACT meeting. This consisted of a long line of tables on an elevated stage with a position for each organisation's representative which overlooked

smaller clusters of tables and chairs where 51 returning residents of the community were seated. The physical separation between residents and representatives undoubtedly made for a confrontational environment which built tension in the room as residents also quickly began to realise the concerns, they had raised in the world café were not being addressed.

7.4.3) Reflection on next steps

Operation Perceptions was not intended as a long-term initiative for Northumbria Police, it represents the approach adopted by *PM1* as a senior officer who was tasked with working towards the goals defined by Vera Baird as PCC as outlined in the Crime and Police Plan, 2016. As part of the PCC's goal, *PM1* received grant funding which was required to be spent in pre-determined period of time. The main objective was to address perceptions surrounding ASB, so it was recognised that a different approach had to be adopted for police engagement which was sensitive to the requirement of listening to communities, rather than being prescriptive. Mutual Gain, as a police focused training organisation, was equipped to deliver the world café style of engagement as suitable methodology for consulting with members of the community and one which would allow for a more calm and collected approach to dialogue with communities. There was a realisation that officers would inevitably find it difficult to listen, hence why there was a requirement for specific tuition about how they could do this in a community setting.

Police had been tasked with engaging communities around the topic of ASB, with emphasis also placed on 'putting victims first' and 'building community confidence'. These priorities directly corresponded to the PCC's Police and Crime Plan that was in place at the time. The objectives outlined effectively formed orders which had filtered down through the police hierarchical structure to *PM1,* who has then delegated it further down the rank structure to individual neighborhood inspectors who could oversee the orders put into motion. However, the engagement events which took place in response to these orders could have been also been

led by the local council or partner agencies; there was not a necessity to lead such events and it is untypical for police to lead such initiatives. However, having police lead the engagements, as an authoritative public institution who does not necessarily engage the public in this way (traditionally), helped illustrate the importance of these engagement opportunities for communities. Having police present at such an event also signifies a sense of security and legitimacy, assuring residents it is a serious attempt to reach out to communities and listen to them. Other organisations, such as the council and partner agencies (such as local charities), would not necessarily have the same community standing or power (legal or otherwise), to bring people together. At its core, the initiative to conduct world café events was, like many other ideas and initiatives, an order passed down through the rank structure which reflected the PCC's priorities at the time and which would inevitably change in the future at the hand-over to the next PCC. Understanding that the initiative was also incorporated as part of a funded grant (for the Mutual Gain training), certain objectives had to be met to satisfy it and the PCC's priorities. The initiative was there for inherently short-term, with no view of continuing it after the necessary criteria for police had been completed.

The issue was that community ideas were being generated at world café events to community problems, and there was no mechanism to allow residents to progress these ideas. Communities had demonstrated, by attending events, that they could articulate what they need, and that there was a desire from them to take action themselves despite a lack of resources. Neither the police nor council had resources available to help progress these ideas. At this point in the case study, it was important to think about world cafés could be configured so that they try and take advantage of the community's enthusiasm for change by utilise untapped capacity from within communities, to try and better them. Officers, as a neutral and non-political entity in the present configuration of a world café could, in fact, form an effective mediator here to try and ensure communities needs and desires are better catered for.

7.5) Chapter summary

This chapter details the work completed as part of the first iteration of action research conducted with Northumbria Police. This includes the preparation and planning in the lead up to the first training event with neighbourhood police officers and representatives from partner agencies. Two community world café and follow-up events were then facilitated by officers in the North East. The events themselves were considered a resounding success by officers and judging the feedback which was received. Community aspirations were raised and there was a sense that change would come about as a result. However, there were underlying issues emerging from the outset of how Northumbria Police were approaching the task to engage with communities, the method and style of engagement as well as how community expectations and outcomes from events were managed in the longer-term. Evidently, community expectations were raised to the point where there was an expectation of longitudinal engagement and support for residents, however, this was never a core element of officer's approach mindset, nor were there any resources in place to support future engagement or even scaffold community generated ideas. To address these shortcomings there needs to be a chance of approach implemented for officers, as well as resources in place to bolster a more sustainable engagement strategy with communities.

8) Resources, Crowdfunding and Capability Building

The first cycle of action research had proved successful in planning and designing a functional and effective world café training programme. The community events which took place in Meadow Well and Beacon Lough East received extremely promising feedback for other upcoming events due to take place as part of Operation Perceptions. However, tensions amongst police officers were evident, and it was unclear if police were necessarily open to this innovating their own approaches to community engagement. Similarly, there were tensions present in communities with the configuration of follow up events and how police and partner agencies had responded to community concerns. Members of the community were generating solutions to their own problems and appeared willing to be a part of the solution, however police themselves lacked direction for how they could mobilise residents because it fell outside the remit of what was expected through the world café process. During this second cycle of action research, I begin by examining the issues which emerged from world café events, the shortcomings of a world café police engagement strategy and how it's lack of longitudinal perspective could prove detrimental to community-police relations.

8.1) Plan. Re-thinking the role of police officers
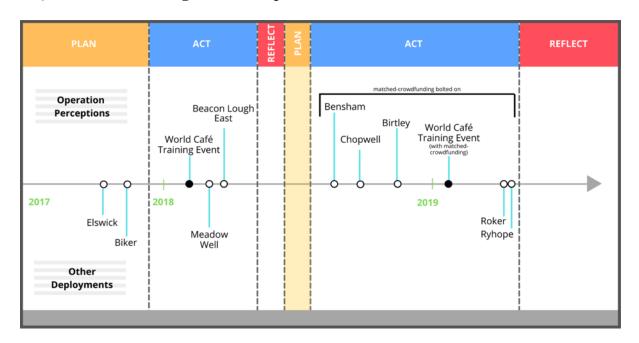
Figure 70 This stage of the case study is highlighted in yellow (Action Research 'plan' stage)

Evidently a bottleneck was present from the engagement with communities as evidenced through the lack of follow-up activity. Despite the success of the world café as an approach to community engagement, and the way it kickstarted police-community dialogue, the outcomes of the events were strongly pointing towards a call for action. Residents were expecting there to be substantial changes because of the successful nature of the event and by principle of how these events were completely different to anything which had taken place before with police. However, police as the leaders of these community-facing events did not possess any means or resources of their own to ensure community generated ideas were actioned. Police had no funding, time and any real long-term intent to further community generated ideas past the point of follow-up events. Therefore, community ideas generated through a process of enthusiasm and raised aspirations which had been co-constructed in dialogue with officers had no starting point. Despite the local council possessing some resources themselves, there was still a lacklustre attitude towards taking the initiative with resident's ideas and turning them into tangible outcomes. Constructing and moulding community-led initiatives fell beyond the brief

of a world café event because it had already been established that the core principle, as set out by the PCC, outlined engagement as a way engaging and supporting residents around the topic of ASB. In the context of public institutions, supporting implied signposting to relevant services.

Even still, police as the facilitators of world café events, and the authoritative organisation which all people (council, partner agencies and residents alike) all look up to for direction and leadership had failed to acknowledge that they could serve as the go-between for communities and organisations. Police, in theory, could serve as 'agents of change', whereby officers shepherd members of the community towards solutions with organisations that possess resources for them to then take forward. However, the drawbacks of this approach could discourage partner agencies (charities) who may perceive it police offloading residents to them, despite the world café's being a police-led initiative. In essence, this is no different to how a PACT meeting might work whereby actions are distributed amongst different organisations; it is acknowledged that this method of generating change is discouraging, slow and not necessarily understood by residents. Another way would be to utilise the motivated residents who willingly attended these events, out of the passion they have to improve their local area. This would involve re-framing residents as localised groups of skilled resource, as opposed to just a collection of co-located people with shared interests and issues. This would potentially solve the problem of who could take forward community generated ideas, however, residents themselves lack resources, experience and self-organisation. Police officers, as the leading figureheads of world café events could transition into the role of 'agents of change', whereby they corral and micro-manage proactive residents to guide them through the process of turning their interest and ideas into outcomes. Still, a bottleneck persists here with how residents' ideas can be transformed into tangible outcomes, given the nature of problems being identified will

most definitely require financial resources of some kind, for the procurement of tools, materials or other specialised services.

It's inherently understood that when pursuing a PhD in an academic environment, you are most often surrounded by others who are engaging in similar or related research projects and initiatives. At the same time as this case study unfolded, external influence from other neighbouring community focused initiatives crept in. The North of the Tyne Community Led Local Development[96] (CLLD) project began in 2017 as a locally managed funding programme to encourage local groups rooted in their communities to suggest, design and deliver projects that contribute to increased employment, business and improved opportunities to enhance local life (CLLD, 2018). The project, headed by Newcastle City Council, received 2.1 million in European funding which is due to end in 2022. The organisation and set-up of the initiative directly involved close colleagues working in the same department. However, a more prominently influential on-going project was the Urban Living Partnership[97] (ULP) which brought together core institutions and organisations from Newcastle Upon Tyne and Gateshead to "*diagnose the complex and interdependent challenges within the urban region, working collaboratively to co-design and implement initiatives and solutions in order to contribute to the life and development of the area*" (UK Research and Innovation, 2016). The initiative was led by Newcastle University and specifically brought together Gateshead Council, Newcastle City Council and Newcastle City Futures who had each pledged financial support towards the initiative. As part of the ULP, a major aspect of how it aimed to support communities was by guiding them through the process of forming and developing community ideas, establishing a plan and gathering support with the help and services provided by SpaceHive[98]. SpaceHive, as a social enterprise, successfully pitched itself as part of the ULP

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[96] https://northoftyneclld.weebly.com/
[97] https://urbanliving.ukri.org/
[98] https://www.spacehive.com/

programme to manage and oversee the civic crowdfunding element of the project. At this point, it was logical to connect the two initiatives so that the police world café program could access financial resources by leveraging the services provided by SpaceHive. SpaceHive provides a web-based matched crowdfunding platform where individual people (or groups, registered charities, public bodies etc.) can formulate their project ideas and configure them to receive support through SpaceHive by making them public and allowing others to pledge towards it. SpaceHive helped people who were pitching by offering guidance on how to present their idea and then begin raising funds. At the point at which funds are raised and when SpaceHive hosted projects reach a set threshold, for example £250 pounds, the project can be matched by one of the original backing organisations (for example, Open Lab or Gateshead Council). Altogether, the organisations involved in the ULP cumulatively put forward a total of £60,000 pounds towards the funding of civic projects across the North East. The ULP became particularly interesting for this case study as it was inclusive of Gateshead, unlike the CLLD project. The opportunity to utilise SpaceHive during this work was entirely opportunistic and was purely coincidental. Utilising the SpaceHive platform and the financial resources it provided access to was thought to help address the emerging gap between community idea generation and those ideas being taken forward as actions.

In order to quickly integrate SpaceHive into the on-going police initiative of the world café events (Operation Perceptions), there needed to be a re-framing of the events to take account of the matched crowdfunding bolt on. In the short term, these changes would initially be reflected in how I communicate the concept of matched crowdfunding to those officers involved in future events. This would consist of trying to re-frame world cafés with a view of offering longer-term support for communities. More significant changes to the training programme would be needed so that it incorporated a longitudinal focus on how to utilise financial resources through SpaceHive, by implementing structured guidance for how officers

should adapt to helping residents compile ideas into small tangible community projects fit for matched crowdfunding.

8.1.1) Establishing new requirements

A series of new requirements were rapidly established which took into account the feedback collected from the initial training event, the Meadow Well and Beacon Lough East world café, as well as the points highlighted during the reflection of the first action research cycle 7.4) .

The training event which took place in February 2018 provided critical insight into how officers perceived the world café concept and the way in which it was taught to them. Ultimately, instances where police officers outright disagree with the engagement methodology as a point of principle is beyond the scope of what can be rectified at this stage, given there are at least three remaining world café events due to take place as part of Operation Perceptions; this is, however an interesting point which I unpick in section 8.3) to understand its implications on the current state of innovation in the police. What is within scope as part of this action research cycle, is the opportunity to improve the delivery, approach and structure of the world café training and its materials based on the feedback received. Future training should be shorter to more easily accommodate the variances in police workload, shift patterns and demands. Evidently, a full day's training was perceived as being too long, if not a little tiresome, in-part due to the familiarisation activities which had been included; these will also to be removed. Training materials should adopt a more structured template format which will help clarify the sequence of events to provide officers with a logical sequence of actions that require attention in the organisation, planning, running and evaluation of world café events. This will require any relevant information to more concisely delivered to officers in more digestible 'chunks', seemingly like small orders. In addition, objectives and measurable outcomes must be present so officers may understand what constitutes a well-executed world café. More generally, training materials were being shared within the organisation and with

external representatives of partner agencies, so there was a more subtle necessity to standardise the digital format of files (e.g., use PDF files) as well as implement consistent formatting, branding and styling in-line with Northumbria Police organisational standards. Lastly, to help incentivise the training, it needed to be recognised as a course which should count towards officer's continued professional development so that at the very minimum, officers may benefit from undertaking the training in an official capacity.

For community world café events, there is a necessity to subtly adjust the format so that more emphasis is placed on the purposeful generation of ideas, with the intention that community ideas are later adapted into micro-projects which have the potential of being match-crowdfunded. This will change ideas from being generated passively through conversational dialogue, to being purposefully generated, in response to a direct question posed at the world café event. In addition to the change in format of community events, officers' roles will be updated so that they may guide residents, through conversation, to co-construct ideas that can come to fruition. Training material will be updated to reflect these changes in role, however, for the remaining three events that are due to take place as part of Operation Perceptions, officers will not have the opportunity to attend another training event. As a short-term compromise, officers will be briefed in-person prior to the running of a community event to make them aware of their updated role, and the small changes in event format.

8.2) Act. Opportunistically integrating matched crowdfunding
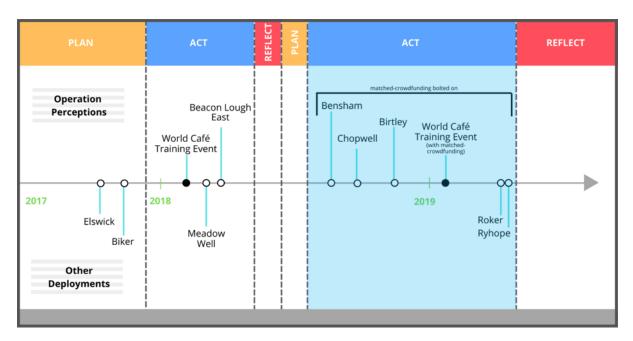
Figure 71 This stage of the case study is highlighted in blue (Action Research 'act' stage)

The decision to integrate matched crowdfunding by adopting SpaceHive's services meant there had to be rapid development to establish a public fund on the platform. With upcoming pre-arranged events, it was also critical to thoroughly understand how SpaceHive's platform worked, how residents could access and utilise it and properly prepare and configure police engagement and the event format to match. A further three world cafés are due to take place in Bensham, Chopwell and Birtley as part of Operation Perceptions. After this initiative ended, there were a further two world café events that took place later in 2019 in Roker and Ryhope which presented an opportunity to deploy the revised world café training. A visual timeline of the physical events which take place as part of this second cycle of action research are viewable in figure Figure 72, with the methods used explained in section 6.5.6)
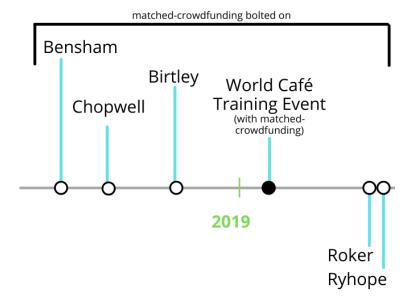
Figure 72 Overview of the physical world café events and training which took place as part of the 'action' stage of the second iteration of action research, conducted with Northumbria Police.

8.2.1) Prerequisite's for matched-crowdfunding with SpaceHive

Prior to formally introducing matched crowdfunding, there needed to be an adequate understanding of how the SpaceHive platform functioned, specifically examining how community projects are managed, allocated as well as how the distribution of funding is configured. The director of Open Lab agreed on a total fund size of £15,000 pounds to be made available through the SpaceHive platform. The fund, named 'Open Lab Perceptions Project', was established and specified how much an application to this fund would be eligible for. The process allowed a person to pitch their idea to the Open Lab fund, raise their own support through gathering financial pledges of their own and when the deadline was reached, the Open Lab fund would match the amount raised. Any application to the Open Lab fund was allowed to access a maximum of £1000 pounds per pitch; the amount was for match-funding, so in theory a pitched idea could raise £1000 pounds in funding (gained through community pledges) with Open Lab matching the final amount raised up to the value of £1000 pounds. Applications which fall below the maximum £1000 pounds match-funding criteria were also eligible so that

smaller community initiatives and pitches which required less financial resource could still apply. The justification for £1000 pounds was established as it was deemed an appropriate amount of funding to reasonably be used for micro-projects – small community initiatives that come about as a result of a world café consultation.

With the financial boundaries in place, the next step was to design the fund's webpage so that it could be made visible. This included a summary of the fund, outlining the purpose of the fund, what outcomes the fund is looking for, eligibility criteria and most importantly the terms and conditions of the fund itself. The fund was established to specifically support the Northumbria Police Perceptions Project, whereby it invited individuals, public bodies, community groups and registered charities to pitch ideas which directly addressed the outcomes of Gateshead based world café events (Figure 73).
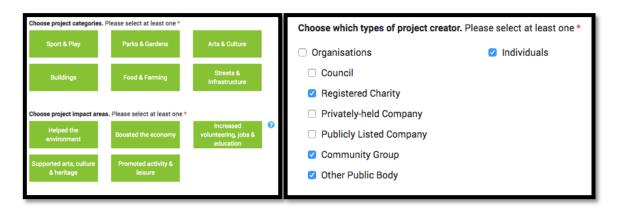
Figure 73 Setting up the Open Lab Perceptions Project on the SpaceHive platform. Specifying any category of project and impact area can be pitched (left) and setting the eligibility criteria (right).

As Open Lab is an academic research group it would not typically be permitted by the University, at an organisational level, to transfer monies to an individual or an un-constituted group of people. To navigate this restriction, it was an integral part of the terms and conditions that Open Lab would oversee the spending of monies for the purposes of funding projects through SpaceHive. As described in section 8.1), this will help to reduce the bureaucratic barriers to accessing funding sources for residents. Asides from specifying what funding could

be used for, how it could be obtained and some minor criteria for eligibility, the fund was made live ahead of the next world café community event due to take place in Bensham, Gateshead.

As there was no scheduled training event due to take place, officers facilitating upcoming world café events needed to be aware of the bolt-on of matched-crowdfunding. Officers were briefed prior to the event starting to ensure they were made aware of the change, as well as what their role would be during the newly added question round. The added question round took place at the end of the event and slotted into the running order by introducing it as the 'coffee' option on the menu (further playing on theme of the café menu). The question posed at events was '*With £1000, what issues would you like to see tackled?'*. For officers, the addition of this final question also served a direct reminder that they should begin to try and develop residents' issues or ideas into tangible projects which could conceivably fit within the scope of a micro-project.

8.2.2) Operation Perceptions and matched crowdfunding

A further three world café events were still due to take place as part of Operation Perceptions. This included Bensham, Chopwell and Birtley as part of Gateshead based community events. Open Lab's matched-crowdfunding fund had been established and was now live, in time for these events.

The 'Best of Bensham' world café event was held in Gateshead Leisure Centre, Gateshead on Thursday the 10th May 2018 (Figure 74). The event was attended by 34 members of the Bensham community. The facilitators of the event were Northumbria Police who were supported by members of Gateshead Council, Gateshead Housing Company and a selection of small independent registered charities (e.g. 'Love Your Avenues' and St Chads Church). Full details from the event can be found in appendix item 11.6). The event was well received, despite there being less people attend than first anticipated. Across all of the world café's that take place as part of this case study, this event had the least attendees. Despite this, feedback

was overwhelmingly positive (Figure 77). Upon analysis of the data captured, 308 individual codes were generated which resulted in 9 themes across the three questions, discounting the fourth question round. The Bensham follow-up event took place on the 5th of June 2018 where 16 residents returned (47%) to discuss what actions would be taken as a result of the consultation.

Figure 74 (Top-left) Police officer engages resident in discussion around community issues in Bensham. (Bottom-right) Discussion between residents, officers and representatives from Gateshead Council discussion solutions to community issues as part of round 4 questioning. (Right) Inspector of Bensham neighbourhood police introducing the world café event to the 34 attending residents.

The Chopwell world café event was held at the Chopwell Community Centre, Gateshead on Wednesday the 4th July 2018 (Figure 75). The event was attended by approximately 45 members of the Chopwell community. The facilitators of the event were Northumbria Police who were supported by members of Gateshead Council and Gateshead Housing Association. Full detail from the event can be found in appendix item 11.7). It is important to note that this event was primarily facilitated by the disruptive officers who attended the world café training in February 2018. The event was considered a success from a

community perspective, however, there was a mix of positive and neutral feedback (Figure 77). Upon analysis of the 338 individual comments, officers generated 103 unique codes across the 3 rounds of data, which resulted in 15 themes. The event summarised three core issues, simply termed as '*community issues*' (a summary of issues), '*Council*' and '*Police*'. The Chopwell follow-up event took place on the 30th August 2018 and was facilitated by Northumbria Police officers and representatives of Gateshead Council. In total, 18 residents returned to discuss actions as a result of the consultation process (40%).

Figure 75 (Top-left and bottom-left) The Chopwell world café event in progress. (Right) Residents engaged in conversation with a member of Gateshead Council.

The 'Best of Birtley' world café event was held in Birtley Community Centre, Gateshead on Thursday the 27th September 2018 (Figure 76). In total, 48 members of the Birtley community attended with facilitators of the event being Northumbria Police and Gateshead Council and Gateshead Housing Company. In addition to organisational support, the Birtley world café also attracted support from residents who volunteered to help by way of providing food and drink, which was donated by individual residents for the event. Full detail from the event can be found in appendix item 11.8). The event was considered a success and was very well received from

members of the community who indicated they had an overwhelming positive experience (Figure 77).

Figure 76 (From left-right) A series of images taken from the Birtley world café event. Two rightmost images depict residents in discussion.

The follow-up event was held at the Birtley Community Centre on the 17th October 2018. This event attracted 27 members of the community back (56% of the original participation). The event was hosted by a small cohort of residents from Birtley who had previously attended the world café. Representatives from Gateshead Council, Gateshead Housing Association, Northumbria Police and Keelman Homes[99] (not-for-profit Gateshead based housing charity) were in attendance but the event itself was facilitated by local resident's and Birtley resident's association.

Figure 77 (Left to Right) Bensham, Chopwell and Birtley world café feedback

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[99] https://www.keelmanhomes.org/estates-look-branch/

8.2.3) Roker and Ryhope community events

It was not anticipated that there would be any more world café events conducted by Northumbria Police now that Operation Perceptions had come to an end in Gateshead. However, in early 2019, Northumbria Police's Southern Area Command's Community Engagement Team outlined plans to run two world café events in Roker and Ryhope, Sunderland. A further cohort of police officers and representatives from partner agencies would require training in order to understand the configuration of how world café's operate. It was an opportunity to deploy the newly refreshed training material which had been revised from feedback collected during the first action research cycle (see section 7.4.2).

The training event took place in April 2019 and was attended by 37 participants, primarily made up of neighbourhood police officers but also representatives from Sunderland City Council, British Red Cross, Foundation of Light, Gentoo, The Salvation Army and Sunderland Community Action Group. I facilitated the now cut-down training session, with support from neighbourhood officers from Central Area Command's CET. The session itself now lasted only two hours, with a small allocation of time for Central's CET to step in and provide reflection on their experience of utilising the world café engagement method in Gateshead. It was beneficial to have the support of CET at this training session so that they could provide an officer focused experiential account and recommendation of the value they found in the training and the community engagement methodology. These accounts served well as justification towards the use of the world café approach and may have helped to overcome any negative outlook about the approach that may have been present with neighbourhood officers from the Southern Area Command; having officers from a different area command explain their experiences may have helped to '*sell*' the concept, as well as justify the purpose of the matched crowdfunding.

The Roker world café event was held at the Dame Dorothy Primary School on the 26th June 2019 (Figure 78). The event was attended by approximately 38 members of the Roker community. Facilitators of the event consisted primarily of Northumbria Police who were supported by members of Sunderland Council, British Red Cross, Foundation of Light, Gentoo, The Salvation Army and Sunderland Community Action Group. Full detail from the event can be found in appendix item 11.9). The event generated 500 individual pieces of data, which resulted in 296 codes and 9 distinct themes. The main outcomes were summarised as environmental concerns, community cohesion and youth provision. The Roker follow-up event was held at the same location and was attended by 17 returning residents (44%). The event was hosted by Northumbria Police officers with representatives from Sunderland Council, Foundation of Light and the British Red Cross outlining the main outcomes of the world café event, as well as actions to take forward.

Figure 78 (Top-left) A police officer discussing community issues with a table of residers. (Bottom-right) Residents taking notes (data) on the tablecloth. (Right) A police officer drawing out visual notes for the Roker world café.

The Ryhope world café event was held at the St Pauls Church of England School in Sunderland on the 27th June 2019. Unlike other world cafés that engaged adults from a particular community, this event focused solely on engaging young people aged between 11 and 14. The facilitators of the event were Northumbria Police who were supported by teaching staff from St Paul's school. For this event, there was no follow-up event because the ideas and suggestions put forward by children were discussed at an internal school meeting which took place in October 2019.

8.3) Reflect. Matched crowdfunded community engagement
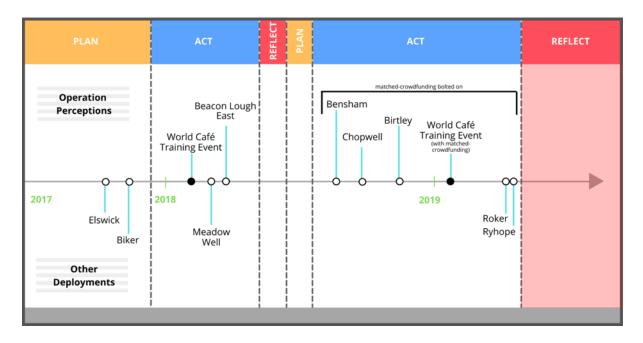
Figure 79 This final stage of the case study is highlighted in red (Action Research 'reflect' stage)

Integrating matched crowdfunding as a bolt-on to police-community engagement had at best, mixed success. Uptake of community pitches to the Open Lab fund on Space Hive was lacklustre with limited police engagement with the scheme. In the following subsections I reflect on community data generated from world café events, my own ethnographic notes and observations, as well as the insights from five interviews conducted with police stakeholders (see section 6.5.7) for more details about methodological approach). From these findings, I draw implications and provide recommendations for how a police training programme could

hypothetically be designed to take account of the points raised. To illustrate these insights, I demonstrate how they could take form by exemplifying my recommendations in a mock-up prototype of a police training programme using the online Google Classroom learning environment.

8.3.1) Prominent issues and themes of concern

The world cafés were well received by communities across the North East and demonstrated that they can be an effective format for meaningful community dialogue between public sector organisations and residents of a particular area. For police in particular, the initiative was an effective way of building trust, rapport and community intelligence which could be used to help define local policing priorities and the distribution of officers and other resources, as a response to changing policing priorities. Similarly, other organisations such as local councils and partner organisations were able to engage in useful dialogue with residents around some of the issues they presented. For residents, feedback indicated that events provided a novel opportunity to engage with their local police officers who are directly responsible for policing their residential area which helped to raise confidence, trust, build rapport whilst inspiring safety through transparency of the initiative. Residents were grateful for the interaction opportunity and indicated at numerous world café's that they are '*looking forward to the next one!*', indicating such interactions had raised resident's aspirations of what was to be done as a result of these consultations in the future. Across the world café community events residents typically raised similar discussion points which centered around three the following three themes: community cohesion, environmental issues and public safety concerns.

Community Cohesion: Residents highlighted a decline in a *'sense of community'*, the feeling of not knowing well enough others in their immediate surroundings. This was commonly associated with landlords and how the rise in accommodation for rental was driving a more transient living style for people in these areas. For example, residents who attended the

Bensham world café experienced a lower attendance where the vast majority of attendees indicated they were long-term residents who owned their properties. There were calls for the local authority and housing associations to approach landlords of rental properties to take action to ensure properties and their surroundings were kept tidy and safe, in fear of them falling into disrepair and lowering property prices in the area. Residents made it clear that they were aware of a constant turnover of neighbours and how it impacted their ability to engage with their neighbours. Comments such as "*All our communities should come out and get involved together - playing, talking and helping each other*" [Beacon Lough East resident] and that residents should "*get together as a community and organise trips and events for all ages*" [Birtley resident] were considered ambitious however, clearly illustrated a desire for community bonding opportunities, such as the world café events.

Environmental issues: Across the range of world café events, residents would always raise issues associated with their direct environment, be it street lighting, frequency of grass cutting, condition of the pavements, littering or excess dog fouling. Comments concerning littering and fly-tipping received the highest frequency re-occurrence and in some areas such as Bensham and Beacon Lough East, it was commonly associated with those who rented their properties on a short-term basis. Residents who attended the world café's appeared to take pride in their neighbourhoods, and there was a distinct notion that 'a clean neighbourhood, is a good neighbourhood', prompting many residents to leave comments addressing the issues: "*sorting out rubbish in back lanes*" [Bensham resident], "*Improving lighting in all areas*" [Beacon Lough East resident], "*More street cleaning and less fly-tipping*" [Bensham resident] and "*More bins for dog walkers, instead of throwing waste into hedges!*" [Birtley resident]. Much of discussions that took place around micro-projects that could help overcome these issues were community tidy-up's and litter-pick drives with funds being envisioned to be

allocated to the purchase of equipment such as gloves, pickers, safety equipment and in one case, a communal skip for the clearing of rubbish in alleyways.

Public Safety Concerns: A strong recurring theme throughout all events related to the community and neighbourhood perceptions of safety. Residents would typically outline their concerns relating to youth disorder, drug and alcohol abuse: "*Drug abuse has to be tackled on the estate teenagers and older. Kids are finding hypodermic needles in the park!*" [Beacon Lough East resident]. Every world café event highlighted youth disorder as something which police, in particular, needed to act upon: "*Too much anti-social behaviour in this street!*" [Beacon Lough East resident]. In other areas, such as Birtley, the problem of youth motorbike ASB was strongly highlighted through the community data. However, in some communities, such as Chopwell, comments highlighted a lack of trust and confidence in local police in their effectiveness to respond to 999 emergency calls. Many of the ideas thought up to tackle ASB by residents highlighted a desire to start a neighbourhood watch scheme where residents could police their own communities, to a certain extent: "*Start a Neighbourhood Watch Scheme!*" [Chopwell resident]. Similarly, there was a strong desire across all events to create more youth provision and opportunities to dissuade young people from ASB and loitering.

Whilst the topics highlighted at the world café events by residents are not particularly novel, they are a true and honest reflection of how communities perceive their neighbourhoods. Arguably, police, council and other partner agencies could pre-empt many of the problems flagged by residents however, there is value gained from understanding the effects of some of these issues first-hand for representatives of organisations that have dealt with them in the past. Understandably, apart from ASB, many issues are traditionally not a policing concern and never will be because they are dealt with by either the council or partner agencies (or both). Similarly, ideas that were generated in response to these issues by residents were arguably standardised and logical for what would normally be considered a reasonable community

response to a problem. For example, a problem with ASB in a community results in neighbours forming a neighbourhood watch scheme so that they can more effectively coordinate an outcome in communication with local police. Therefore, the true value of a world café engagement from a residential perspective is not necessarily the problems raised, but their belief that by highlighting them to police, as an authoritative organisation with legal backing, there may be a higher chance of achieving an outcome.

The reoccurrence of a limited number of generalisable themes across a series of world café events helps to establish implications for the design of future training packages. Issues related to environmental concerns, anti-social behaviour or general disruption and community cohesion could in theory have standardised responses which have been templated for the area they are being applied. It appears logical that issues associated with the aforementioned themes of concern do in fact need to be acted upon, because they are essentially expected. Police, in conjunction with the council and partner agencies could pre-empt such issues, such as excessive litter, and outline a working instructional template which simply requires residents to sign up and volunteer their time. The template would have the more minor details surrounding the establishment of a group, the resources they need and how it is managed inherently baked into it, so the only variable left for officers to plan for would be resident's willingness to participate and the logistics associated with executing of the solution (e.g., the date and time of a community litter pick). Depending on the relevance of the solution, or micro-project, which is put in place, it could be handed-off to the most appropriate organisation to follow-up. For example, it wouldn't necessarily be logical for police to lead a community litter pick, this would be more appropriate for the council to take charge of. It would, however, be logical for police to engage with residents about constructing a neighbourhood watch scheme in their local area.

8.3.2) Under orders

During Operation Perceptions, police assembled their final reports for each world café event with my guidance. They were typically treated as confidential internal reports until they had been looked through and approved by police management; this was normally the neighbourhood Inspector or Chief Inspector. Only at that point would the report then be distributed to residents ahead of the follow up events. This process allowed police management the opportunity to check for comments they deemed inappropriate to be included in the document, such as comments that may damage police-community relations further or portray them (as the local neighbourhood police) badly. For example, at one world café event, a number of residents had left comments relating to their distrust towards the police as public institution: "*No trust, bad experiences, appearance is intimidating*" and "*Authority figures [police] not having the capabilities of years ago – internal corruption*". These specific comments were removed from the public report of that world café. When questioned as to why this had happened, police management responded with: "*it'll cause a problem; we shouldn't leave that in*" [Senior Police Management]. I share this this anecdotal information in light of public interest and transparency. Such forms of censorship can potentially prove damaging for police-community relations especially considering the UK's approach to Policing by Public Consent[100]. It is not in the interest of police, as a trust-based authority, to broadcast self-incriminating material which could negatively reflect on the organisation's reputation. However, comments relating to Chopwell resident's disappointment over response to 999 calls did in-fact make it into their final report, possibly because this was not then distributed to the public at their follow-up event. Small instances where there is an apparent lack of transparency in police reporting practices as part of the public engagement events brings into question the

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[100] https://www.gov.uk/government/publications/policing-by-consent/definition-of-policing-by-consent

implications this behaviour could have on future attempts at building and maintaining community trust relations.

In addition to the aforementioned cases that exemplify how a lack of transparency can affect police-community relations, the findings suggest police officers struggled to support residents and communities in helping them materialise possible bottom-up solutions their community issues. This was evident from the single community idea which progressed through to be successfully matched-crowdfunded as a result of the world café consultation process at Bensham, Gateshead. Attending residents of the world café outlined a desire for more activities that promoted community cohesion with an idea that forming a community choir could be a good first step. The idea was generated by residents however the set-up and management of the SpaceHive pitch to Open Lab's fund was completed entirely by a representative of St Chad's Church who themselves had extensive bid-writing experience and understanding of navigating funding processes. It became apparent that the demographic of the residents who had initially thought of the idea were unlikely to possesses the technical capacity to initiate it themselves, nor would they necessarily know how to self-organise as a cohort. The pitch, named 'Bensham Sings' (Figure 80) was successfully match-crowdfunded receiving £1840 pounds. The funding helped to hire a singing teacher and contributed to the room rental at St Chad's Church. Despite community attendance at the Bensham event being comparatively low to other world café's, it demonstrated that having the presence of local charities and representatives from outside organisations actively taking part in community discussions helped to shape ideas and transfer the management of matched crowdfunding to individuals who better understand these processes and who may have prior experience or resources of their own. Other world café's failed to initiate any ideas generated which resulted in no other projects being matched crowdfunded as part of the series of community events. It's too far-

fetched to expect residents to self-organise and be proactive at doing this, given their apparent lack of familiarity with such processes.

Figure 80 The Bensham Sings pitch which was successfully match-crowdfunded as a result of community generated ideas from the Bensham world café event.

Similarly, it was unreasonable to think that police officers, as facilitators of the world café events, would be in any better position than residents themselves to organise and manage residents through a matched crowdfunding process. It was short-sighted to believe that by defining a path to access resources would result in a successful outcome. Officers, for the most part, do not poses the capability to engage in these kinds of processes as it's not an integral part of their role which they have ever had experience of before. This was particularly evident from the lack of officer's enthusiasm and reluctancy to engage with communities to provide additional support and scaffold community ideas. On reflection, *P4* noted this is simply because a police officer's role does not provide them adequate time to engage in this kind of activity and "*Unless you've got somebody willing to say, 'I'll organise it', it'll not go much further" (P4).* It was understood that many community ideas and attempts at putting together micro-project still had a chance of failing or losing residents interest over time: *"so, my honest opinion is there will be a lot of times when it [community interest] will just fizzle out" (P4).* However, world café events such as Ryhope, which were conducted in a school for students

and facilitated by a mixture of school staff and officers, demonstrated that officers can have the intuition, initiative and creative licence to adapt this engagement technique. For instance, the neighbourhood sergeant who facilitated this event understood that connecting with an establish organisation (i.e., a school) would invite others into the process who possessed more experience of navigating funding paths, such as the matched crowdfunding. It was, however, unfortunate that due to the constraints of the officer's role and their own time constraints for piecing together the required documentation (a world café report and outcomes) resulted in them missing the deadline for establishing their micro-projects because the ULP project (and the subscription to SpaceHive) had expired.

The approach taken at the Ryhope and Bensham world café events both utilised NGO's to help attendees develop their ideas and, in Bensham's case, successfully apply and secure funding. Whilst Ryhope was not successful in obtaining matched funding for other reasons, both world café's demonstrate the value of utilising pre-existing community links with NGO's who may have more experience of navigating funding routes, access to resources of their own and may also have aligned values or on-going initiatives with the outcomes of the world café events. With hindsight it is clear to see, and if matched crowdfunding through SpaceHive had not been available at the time, accessing resources through these channels would have been the only alternative. Interestingly, neighbourhood police are very much aware of their communities and are most certainly aware of their co-located NGO's. It would stand to reason to embed such events even deeper into the community by also inviting representatives of these organisations, as existing proactive local stakeholders who possibly already understand a community's tribulations. In the current format of the world café, it appears evident that police officers themselves should not necessarily act as the broker between the community and organisations, but simply be the facilitator of these public events that allow residents and representatives of local organisations to meet. Neighbourhood officers can utilise their own

existing working knowledge of the community, it's layout and the organisations that exist within and bring them together at these events. Community stakeholders from NGO's already exist with the necessary skills and possible access to resources, so why should officers be expected to adopt this role if it is outside their own skillset and they are not necessarily effective at doing it.

There was a view taken by police management that the community events themselves, regardless of their outcome, were a "*quick win*" as they were already providing a far richer experience for residents when compared to PACT meetings. The enthusiasm displayed by officers in world café events demonstrates a willingness to engage however, the depth of officer's interest in continued involvement is inevitably going to be dictated by police management when order and priorities change. This ultimately results in police management not providing their officers the time to continue supporting emerging ideas from events and instead allocating new tasks in-line with hierarchical and centralised operations, or a 'box ticking' approach. After the main world café event, police officers began to disengage with members of the community. The nature of policing dictates that police typically undertake small measurable tasks which are compliant between fixed parameters set out in law or rigid processes. Arguably, it is not an inherent characteristic of an officer's role to engage in longer-term projects which do not necessarily operate between defined and fixed boundaries. To help overcome issues of police disengagement in the latter stages of community engagement, the training approach could be adapted so that it incorporates an element of pre-planning through use of templated solutions which address the typical themes of concern (environmental, ASB and community cohesion), as pointed out in 8.3.1) Adding to this, there also needs to be a greater incentive for officers to continue with these lines of engagement that stretch beyond officers perceiving it as just another order from police management..

It is also important to stress the difficulty of using and adapting a seemingly widely used and straightforward communication method, such as the world café, for a community policing context. Difficulties ranged from organising timings and locations of training sessions and police indifference towards such training methods. For example, at the request and feedback of police who went underwent the first training event in February 2018 which lasted a single day, the second training event was condensed significantly to better accommodate officers. Additionally, officers voiced their preference for concise information delivery methods such as presentations, handouts and summary documents, as opposed to group exercises and table activities which required role play. In normal circumstances, the use of role play would in fact put people in a stronger position to learn through practice, however for officers, it appears the constrains of the role coupled with the working culture of adhering to process has resulted in a strong preference for rapidly digestible instructional information. Officer's reactions are understandable, given the hectic schedule of a police officer's day-to-day duties, and especially considering the effects of austerity in the policing sector and the additional responsibilities each individual officer will be managing. For example, the seemingly simple task of grouping officers together for the second training event proved extremely difficult as it necessitated officers to rearrange scheduled appointments, allocated break times and even coming into work on their day off in order to attend. Some officers were not able to allocate time as part of their schedule and had to drop in and out of the sessions due to incident resourcing requests.

Understandably, neighbourhood officers operate independently and structure their day-to-day duties around the commitments of their role. However, as evidenced from the second training event, it is still difficult for officers to put aside short periods of time for the purpose of attending a training event. A mixture of varied shift patterns, role commitments and the spontaneous nature of when an officer may be required to attend an incident all impact their

ability to block out large portions of time. One method of overcoming the necessity to attend a physical event would be to replicate the training material so that it is available online. Whilst this is a simple solution at first glance, it would be a viable way of providing officers with the necessary resources, should they not be granted the necessary time to engage with in-person training events. To help illustrate how the world café training programme could hypothetically be configured as an online resource, I have designed a prototype of the programme using Google Classroom[101] to reflect on how it may work in practice.

The configuration of material for an in-person training event into an online learning resource which is self-led requires a re-structuring of content, especially given the specific nature of policing and its emphasis on a task-based approach to executing orders. Officers are conditioned to interpret small pieces of condensed informative and instructional information; however, the world café training events did not fit in with current working routines and learning culture present in Northumbria Police. Google Classroom was chosen as an appropriate platform to use because it offered a suite of features native to a learning environment yet is an 'off the shelf' and readily available free platform to use. In addition, the platform also offers features which extend beyond the scope of what may be needed as part of this use case, but extra features none the less which could feasibly be utilised by Northumbria Police at a later date with further development. Utilising a free platform, such as Google Classroom (or technically, un-platforming), allows the delivery of training material to be accessed at any time online and allowing officers to engage with the material in their own time and around their commitments. However, with the freedom attributed with accessing resources and self-led learning there also needs to a measurable approach taken to ensure officers are engaging with material. Understanding that police have very resource themselves, it's in their interest to host

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[101] https://edu.google.com/products/classroom/

material on such available platforms so initiatives like the world café can continue in a financially sustainable manner.

Training material was first re-configured so that it took the form of short informational documents. The material for a world café was broken up into individual lessons which were then spread across three modules (Figure 81). The modules consist of 1) an introduction to the world café methodology, 2) how to plan, organise and run a world café and 3) information about follow up events and data analysis. Individual lessons take the form of short-read informational pdf documents.

Figure 81 The Google Classroom world café training programme consist of three core modules, 10 individual lessons with two informal assessments and one formal assessment.

In addition to the three core modules, an introductory module is also in place to provide an overview of the course content, its structure and how it will be assessed. Officers can choose to work through the provided workbook which is also used as a means of informal assessment for module one and two (

Figure 82). Each lesson contains a series of learning objectives and outcomes with an opportunity to reflect back on the content at the end of each lesson (

Figure 83). Having information presented and available in small manageable sections caters to the sporadic workload of officers, however it is also more in-line and familiar with how Northumbria Police deliver their own internal training as part of CPD. Police rely on orders with defined goals and/or outcomes, and the working culture surrounding CPD also reinforces this notion of small and measurable steps towards completing larger goals. The presence of explicit learning objectives and outcomes reinforces the current working culture, but is also an inherent part of any good learning experience to understand the purpose of what you are doing, why you are doing it and how your own understanding can be measured.
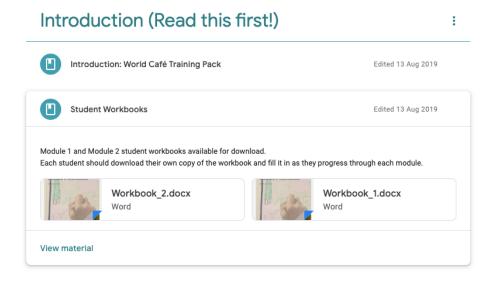
Figure 82 world café introductory module with student workbooks available for module one and two.

Module one begins with an introduction to the world café as a methodology for engaging communities in dialogue, building on critical background information which helps to reinforce it as a viable technique and its appropriateness for policing. Following on, lesson two provides an overview of the roles in a world café and where individual actors can fit in to help run an event. Lesson three examines what data is, in this context, as well as providing an overview of how data is captured at these events. The final lesson in this module examines how questions are used to elicit information, and how these questions can be constructed and configured on a per-event basis.

Module two is designed to be more focused on how an event can be planned, identifying a range of aspects which need to be considered when thinking of conducting a world café event with community residents. Lessons in this module touch on the format and running order of a world café, the use of incentives for recruitment, how residents can be approached, notes on venue selection and layout. This module is practice led, offering a number of supplementary materials which officers can use as fill-in templates or as an instructional guide. For example, there are sample recruitment scripts which can be downloaded, configured and printed to hand to each officer who goes out into the community to advertise the event. Other templated resources included as part of this module such as demographic monitoring, written introduction scripts, event checklists and sample menus (agendas) are also included.

By offering a templated outline of a world café and the resources for carrying out planning, officers will be able streamline the planning and logistics of organising events with a templated outline ensuring world cafés are executed consistently across different neighbourhoods. Officers were not effective in enacting the role of a broker between community and NGO's, so the importance of their role at world café now lies in planning and execution (facilitation) of them, which does fall beyond the boundaries of their skillset. Templates help to define the order of events and the tasks for what must be completed and considered when establishing a world café with a community.
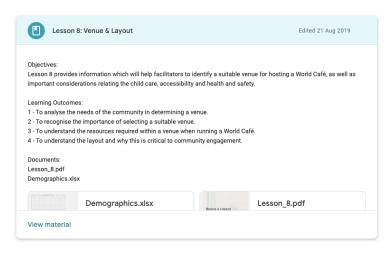
Figure 83 world café online training resource showing objectives and learning outcomes.

The final module focuses on the follow up events which must take place as a result of a world café and outlines, in more detail, how analysis is conducted on data which has been collected during the main event. This module also contained an in-depth guide for how officers could create pitches on the SpaceHive platform with a walk-through for each part of the process. As part of the assessment implemented into this module, it is necessary to have conducted a world café and follow-up event whereby a summative report and evidence of data captured is required to pass the training programme.

By integrating elements of assessment into the online training programme, there will be an element of accountability for officers to engage with the material, as well as motivation to achieve an adequate outcome with communities. However, assessment alone will not be effective in spurring officers into working through material, so the course should also be integrated into the organisation as a recognised CPD. By officially recognising the course as CPD, there is an incentive to engage in the subject, with officers pragmatically assessed through the facilitation of a live event with community stakeholders. The issue of officer disengagement or disapproval of the world café as a valid method of community engagement still remains, however, this can be catered for to a certain extent. Introducing testimonials from other officers as part of the training programme would allow other officers to gauge the value in this approach. The inclusion of officer from the CET in the secondary training event which took place allowed experienced officers to 'pitch' and 'sell' the world café concept, which was well received as it came from another officer, rather than me, who was perceived as a researcher. Of course, if time allows the ability to run an in-person training event may be preferable to some so the training programme should also contain facilitation notes for officers who wish to deliver this training to others (Figure 84).
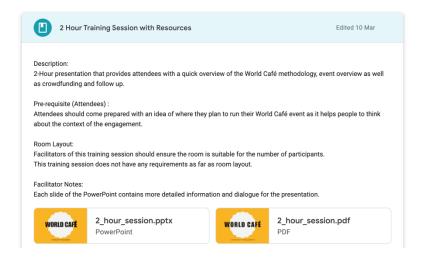
Figure 84 World Cafe facilitation notes for police wishing to deliver in-person training

8.3.3) Emerging Tensions

In addition to the difficulties faced in engaging police officers in participatory community engagement methods during training, some officers clearly demonstrated that they had contrasting views regarding the world café process which created tensions between police and police management. The tensions which arose during the training session are described in more detail in section 7.4.1) However, this also caused tensions between other officers who were not senior management. The cohort of Chopwell officers who had disengaged in the initial training event struggled to properly embrace the world café approach and further struggled to facilitate their event in July 2018. One of the core purposes of a world café was the opportunity for local police (and partners) to listen to what residents had to say however, the Chopwell officers instead took this as an opportunity to relay how they had already responded to much of the issues raised by the community. In essence, the event was sold to residents on the basis that people could voice their issues but were then confronted by officers and told that their concerns had already been addressed and that it should not be their concern. Understandably, this led to heightened tension between police and residents, resulting in confrontational dialogue and police having to defend their response. The apparent lack of understanding for Chopwell officers for how a world café event should be conducted also caused tension with other police

officers and partnering organisations who felt their efforts had been diminished. Naturally, this only increased tensions between the Chopwell cohort of officers and their senior management.

At other world café events, similar levels of tension were also appearing between some police managerial staff's behaviour and lack of understanding of the world café methodology. Officers became increasingly irritated at management's lack of comprehension about the time and effort taken to plan, organise and run a world café event. One notable example occurred at the Roker event when a senior police manager attended in full uniform which resulted in community hostility directed towards the police. This appeared to stem from the perception that senior management were actively portraying themselves as an authoritative figure in a position of power at the event, when in reality they were simply oblivious to the intentions and format of the world café because they had failed to attend the training themselves. In a similar occasion, a manager's contentious attitude resulted in a belligerent community response which was far more familiar to a PACT meeting, but far greater amplified due to the number of attending residents. The manager was unaware of staple aspects of the world café format including questions and expected etiquette. At some events, the behaviour and approach of police management contrasted strongly against the enthusiasm of other officers in facilitation roles, conducting discussions and participating in open conversations. These situations exemplify the fine line of care that police, as representatives of their organisation, must take when engaging with members of the community in organised public-facing events.

Utilising a templated approach to organising world café community engagement events, as well as ensuring officers are assessed on the outcomes and of their events can help to reduce the probability of instances of poor organisation are minimised. Chopwell officers would effectively be held accountable as part of the process if it is being formally assessed as part of CPD. By introducing the world café engagement methodology as CPD, the accountability would need to be configured so it does not stay within the chain of command.

As seen at numerous events, senior police management were equally as guilty of not engaging with the world café concept and learning, and they were potentially jeopardising other officers work by stepping in to facilitate events blind. All officers, no matter of rank, should be required to work through the CPD course for a world café, but accountability of carrying out an event properly should lie with an independent department (e.g., such as the Learning and Development team).

8.3.4) Issues of sustainability

From the outset, Northumbria Police's world café initiative appeared to focus on community engagement in the short-term. Senior management would frequently refer to the events as a "*quick win*", which did negatively affect the initiatives continuance with implications on the future development of community issues and concerns. With the integration of matched crowdfunding, it was hoped that more emphasis could be shifted towards a more longitudinal way of thinking about the long-term implications these events could have for communities and community-police relations. However, the act of integrating matched crowdfunding raised additional concerns for the viability and sustainability of similar future police-community engagements.

Police senior management stated world cafés were "*empowering*" communities despite residents' engagement in micro-projects having an extremely low uptake. From all of the engagement events, only the Bensham event managed to successfully result in a funded micro-project and this was not necessarily attributed to residents themselves. Only a small minority of an event's attendees would typically express interest in getting involved in progressing a community idea into a micro-project. Acknowledging this, police management remained adamant that utilising the world café approach provided a better starting point: *"[...] with the world café, you're planting that seed"*. In practice, officers generally refrained from involving themselves in the dialogue process and heavily relied upon proactive residents to self-organise

and coordinating with representatives from partner agencies, if they felt they had an idea which they would like to pursue. Open Lab's fund on the SpaceHive platform provided an accessible funding route, offered a channel of support for individuals or groups to operationalise their ideas into micro-projects however police refrainment from grouping keen residents together during the event resulted in a rapid dissolved community interest. Alternative and more conventional (and sustainable) funding routes are more difficult to obtain for example, council funds stipulate residents must firstly gain recognition as a constituted group to be eligible to apply, which in most cases would be detrimental for further community engagement due to initial time and effort it would require to get this certified. In addition to the origin of funding opportunities and the eligibility of community members to access it, the clarity of the process of applying and navigating public funding opportunities also stands an imposing barrier to entry. For this work, and in order to action the community suggested projects we proposed SpaceHive, a platform and a service designed specifically to fill the resource gap between community ideas and their operationalisation. The subscription cost for the use of the service totalled £20,000 pounds which is a significant amount. If the police were to utilise such a service in the future, it would be unreasonable to think this would be an option given the current state of policing which has been imposed by austerity cuts. Despite alternative (and free) platforms being available, the opportunity to utilise SpaceHive as a platform and supporting service initially suggested it may increase the likelihood of community ideas being taken forward. Despite the efforts of police and their best intentions, the SpaceHive platform was severely underutilised as a part of the world café engagement intervention.

In considering the upfront financial implications of a single year's subscription to SpaceHive, the lengthy and tiresome bureaucratic process of applying to alternative public funds as well as post event problems of organisation and signposting for community members across the world café events; the sustainability of resourcing police initiatives for community

engagement becomes a real concern considering that throughout the intervention officers were provided with all the resources needed, yet failed to effectively signpost community members to these resources or make use of them themselves. It is understood that longitudinal engagements with communities will require more financially viable sources of resourcing, and the sustainability of world cafés will ultimately depend on commitment of police management in how they coordinate, resource and manage their approach.

Northumbria Police did not initially set out down the world café route with sustainability in mind, mostly because it was framed as an order handed down from the PCC. Senior management understood it as a short-term initiative with their involvement in community engagement effectively ending at the follow up event. However, the use of the world café methodology and its radically different and positive way of engaging people raised community expectations to the point where communities enjoyed the interaction, and looked forward to future events and opportunities to engage in similar ways. The world café methodology proved immensely effective in corralling members of a community however, there needs to be an understanding of the implications of doing such intensive engagement and then what disengagement will do to future police-community relations. Framing surrounding such approaches needs to be carefully considered and brought in line with the intentions of how police plan to proceed with communities after initial engagement. For example, if the intention of the engagement is purely to gather intelligence (through conducting a world café), it must be made clear by properly configuring the questions for the event so that follow up actions are not necessarily expected from communities; this will help to lower community expectations in-line with how police want to utilise the events. Similarly, should the intention of police to be to determine on-going issues, then they must utilise existing links with NGO's, the council and partner agencies who can effectively relieve officers from the task of guiding any willing residents to an actionable outcome. For longitudinal engagement, the inclusion of

other stakeholders who have access to resources or resources of their own is critical, given it is financially unrealistic and unsustainable to rely on external services such as SpaceHive for this.

8.4) Chapter summary

In this chapter I have explored the resource bottleneck that emerged from police utilising the world café methodology as a community engagement technique. Community expectations were being raised with the anticipation of action being taken however, officers disengaged with the initiative due to the short-sightedness of the order received and the inability to resource actionable outcomes, despite community willingness and enthusiasm. As a knee-jerk reaction to realising these limitations early on, I latched onto on-going initiatives being conducted at Newcastle University (and through Open Lab) which resulted in the sporadic integration of matched crowdfunding as part of this case study. The matched crowdfunding provided a means of accessing essential financial resource, and by re-positioning police officers as 'agents of change' or community brokers that shepherd residents from idea generation to funded micro-projects through use of the SpaceHive platform. An additional five world café events and a single training session were conducted with Northumbria Police and North East based communities with matched crowdfunding support bolted on. I discuss the implications of my findings by examining how the world café engagement style and training fit into current policing practice and working culture, as well as highlighting the tensions that arose between police and communities and between police themselves through the hierarchical rank structure. I reflected upon these finding by developing a prototype training package using Google Classroom to exemplify the implications for the future design of such resources, and how they can be better configured to take account of working environment, sustainability and resource constraints.

9) Conclusion

In this concluding chapter, I consider the insights generated from both case studies to reflect and explore the challenges and opportunities presented and reflect on their implications for developing and designing sustainable interfacing technology. Firstly, I summarise the case studies; then I provide some broader methodological reflections on the work. Finally, I discuss the insights in relation to my research questions. In particular, I consider the importance of needing to design for adoption and governance of sustainable communities' interfaces.

The previous six chapters presented two distinct case studies describing active engagements with communities and multiple stakeholders to understand the role, design and configuration of community technology (public display networks) and initiatives (world café training program) as sustainable interfaces between communities, organisations and public institutions. In chapter 3) I outlined the action research approach adopted as part of these case studies, which was used as the methodological approach to the work carried out across the remaining five chapters.

9.1.1) Overview: case study one

The first case study, spanning chapters 3) to 5), highlights two consecutive cycles of action research which span three years' worth of research conducted in rural Northumberland in the North East of England. This study examined both the role of public displays in how they interface between civic actors and third sector organisations, but also looking at the role display networks play between civic actors. The case study utilised public display technology as a basis for bolstering communication between different stakeholders whereby the public displays were used as a community messaging platform, as well as a mechanism to reach out to young people in an area of prominent youth rural-urban flight. Work began in 2015 with the first iteration of GleNet as a commissioned display network by Glendale Gateway Trust (an NGO) and through

iterative design, deployment and reflection was later re-developed as Showboater (Nicholson *et al.*, 2019). In this context, the emphasis was on understanding the configuration of public displays as an intermediary between citizens and a Non-Governmental Organisations. Showboater was later deployed in a further rural location in Northumberland where it was adopted by a local and proactive member of the community and used for the distribution of digital information amongst the village. In this additional deployment, focus was applied to the role of public displays as an interface between community actors with findings from both deployments providing insight into perceptions around the purpose, ownership, maintenance, administration, moderation and sustainability of these technological artefacts.

9.1.2) Overview: case study two

Case study two unfolded in the more urbanised locations of Newcastle Upon Tyne, Gateshead and Sunderland, with work carried out in collaboration with Northumbria Police as a significant public institution. The case study sprung from an existing relationship with Northumbria Police, which afforded me the opportunity to work as both researcher and police officer, internal to the organisation. Research began in 2017 and ended in 2019 and included two consecutive action research cycles focusing on developing understanding on the role that intervention might play in interfacing between public institutions and civic actors. In this exploration, neighbourhood officers were trained in the world café method of community engagement as an order handed down from the PCC. Officers facilitated community events as a way of positively engaging in informal dialogue with residents to bolter community relations, as well as to better understand the communities and their perceived problems. Through this process it became evident there was a lack of resources to adequately meet and deliver upon community expectations, which resulted in the opportunistic addition of matched crowdfunding as a bolt-on funding mechanism to provide monetary resource for community generated micro-projects. Despite the physical world café's proving a huge success for

community relations (in the short-term), significant issues slowly emerging from the findings, highlighted brewing tensions between police and communities, and internally with the police organisation itself. Additionally, the newly adopted role of officers as part of the intervention, and the lack of forward planning demonstrated by senior police management helped unearth implications for the design of sustainable, integrated and innovative processes with suggestion for how the intervention could be configured to interface between public institutions and citizens.

9.1.3) Reflection on action research

The configuration of technical systems (e.g. a public display) and new innovative interventions, and the roles that people play in the running and configuration of them is undoubtedly a critical factor in ensuring their suitability for the requirements of communities, but also so that they are reliable and usable. Applying an action research approach to system design allowed for the iterative development and refinement of these systems over a prolonged period of time (Hayes, 2011). This approach is particularly important when considering the design and deployment of systems and processes with and for communities, because it allows for the responsive configuration of the initiative to form according to the emerging needs of communities. However, in practice, following an action research approach rapidly became time consuming and effort intensive given how the nature of the researcher continuously engaging with stakeholders in an attempt to embed themselves as an actor into each case study's respective community. In case study one, this was exasperated by the rural locations of the deployments which turned any small task into a minimum of half a day's time spent travelling to either Glendale of Rothbury. In case study two, the formal nature of working as a police officer constrained opportunities of research to a minimum as there was a necessity to also carry out the duties of an officer whilst being mindful of rank, process, and law. Similarly, reflecting on case study two it was evident that despite being in the role of a police officer,

some individuals treat you like a subordinate which became evident during the world café training session where multiple officers were disciplined for poor behaviour through a lack of respect towards myself and the topic as the event facilitator. In a similar context, at times there were external pressures to manipulate results to better suit organisational objectives, for example, in the reporting of findings from world café events in the public reports. Finally, given the high involvement with people and the necessity to form meaningful professional relationships with community stakeholders, it is imperative to ensure results and findings did not become subjective or sway towards personal biases (Kock and Texas, 2015). On reflection, action research was the appropriate methodological approach for both case studies given the gatekeeper nature both studies presented through working inside Northumbria Police and working alongside the community champions of Northumberland (Le Dantec and Fox, 2015). Furthermore, the action research findings of exploring the social implications of the work conducted and its applicability to the wider community, rather than delivering a formal evaluation of a thoroughly tested, highly usable technology 'product' (such as what a user-centered iterative design approach may produce).

9.1.4) Reflection on case studies

In the recent years, HCI has leaned heavily on using purpose built and bespoke platforms for the design of community technologies. Here, removing, or at least minimising the complexity of digital systems in order to enable people to access, operate and maintain them, is seen as a critical aspect. With the first deployment of GleNet, GGT stakeholders undertook a steep learning curve, which resulted in them frequently asking questions, relying on user guides and seeking their own support from external sources. Taylor et al. (2013), noted that the use of off-the shelf hardware, where possible, promoted maintainability and acceptance of physical systems. To a very limited extent, Showboater was an attempt to at least remove the hardware dependency by being able to run a node on any platform, however, there was still

reliance upon a centralised server, which ran custom code. In the second case study, the prototype of a Google Classroom to host a police training programme, although not requiring hardware itself, serves as a more appropriate example of how an intervention can be configured using free, accessible and widely supported tools which may favour the development of sustainable practices in the future. In hindsight, Showboater could have better adhered to the principles of "free and accessible" tools by utilising existing open-source software solutions widely available.

Furthermore, the way in which technology (in its broader sense) and research are introduced and pitched to communities can also have long lasting implications on how people perceive the trajectory of digital systems, which in turn has a knock-on effect on their long-term adoption and use. Taylor et al. (2013), rightfully states that there is a need to a set appropriate expectation when introducing new projects to stakeholders. Reflecting on both GleNet and CoNet's first year of operation, the two different methods of establishing a display network in a community had significant implications on community acceptance. In the GleNet case, I was highly engaged in installing nodes, establishing infrastructure and promoting the use of the network and providing support. This was partly because the public displays were at an earlier stage of design, and also because both myself and the wider community were still learning how the displays could be used, and the logistics required for operating a display network. In contrast, the launch and development of CoNet was more community-led, and it required far less involvement from me. In the case of CoNet, the community stakeholders took responsibility and ownership of the display network and drove its deployment. Stakeholders committed significant effort to advertising, production of promotional materials and community engagement in preparation for the launch of CoNet. The introduction and context of new 'technologies' (e.g. the world café) in the second case study, was significantly different. Indeed, the introduction of the world café's as a way of engaging communities was more

complex. From one hand, police officers perceived the initiative as an order to gain a "*quick win*" in the short-term; on the other hand, the 'revolutionary' format of the world café process and approach raised community expectations and their enthusiasm, leading to the opportunistic integration of matched crowdfunding as a way of trying to meet community expectations. Yet, throughout the process, both police officers and communities' expectations appeared to have been taken for granted, which produced misunderstanding and disappointments. Instead, communities and officers' expectations, roles and responsibilities should have been explicitly voiced at the start of the process and, later on, accounted for, in order to foster any sustainable intervention. Rothbury's deployment of Showboater worked well in this regard, as it was introduced with clear expectations set early on, which allowed community actors to fully understand the initiative and their potential role in it and take responsibility for it from the outset. Below, I reflect on insights generated through the two cases studies in relation to the research questions set out as part of this dissertation.

9.2) What are the challenges and opportunities associated with governance in sustainable community technologies?

Throughout both case studies, governance played a critical role in determining the short and longer-term success of the initiatives. With Northumbria police's training programme, it was clear that the failure to consider the need to shape the governance of the intervention and relying instead on existing mechanisms within the police as an institution, caused tensions between officers, and between residents and officers. Similar tensions occurred within the case of GleNet in Northumberland between residents in Wooler and the charity (GGT), and outlaying communities. No explicit process of developing governance structures and accounting had been undertaken in both case studies. However, it should have been an integral design consideration for both contexts. Integrating governance mechanisms allows for greater transparency of processes and operation, distribution of workload and serves as a mechanism

to foster accountability as well mitigate issues and inter and intra-community organisational tensions. Here, I reflect on the need for considering governance as a key aspect of designing sustainable interfaces, by highlighting examples from both case studies. I recommend approaches that more explicitly bring governance to the forefront of design for initiatives that interface with communities.

In the second case study, it became clear that a proportion of proactive residents involved in the initial world café events had a desire to better their neighbourhoods as small ideas began to eke out for how issues could be tackled at the community level. In an attempt to better compensate residents, matched crowdfunding was bolted on as route to accessing resources. From this point, officers were tasked with shepherding residents towards idea generation and then initiate micro-projects with them by guiding them through the matched crowdfunding process. Officers were disinclined to nurture community ideas, which is understandable considering how far it falls outside their day-to-day abilities and skill set, however, it resulted in no follow-up action for communities. Regardless of whether officers were appropriate actors for this particular task, it highlighted the importance of outlining where accountability sits and who should be held accountable for outcomes not being followed-up as a result of a community engagement. As with Northumbria police, accountability was implied through the existing police governance structure. However, as the world café initiative was perceived to fall outside the remit of regular policing duties and responsibilities, thus accountability, amongst other aspects, were ignored. As a result, nobody was accountable and more importantly, no one was accountable to the communities themselves. Similarly, Northumberland's GleNet suffered as a result of not having a governance framework with genuine community involvement. Even CoNet's success was dependent on a single community champion who has the technical know-how, time and enthusiasm to run the display network. This in turn solidified their position of authority and influence within the community by growing their portfolio of enterprise. In this

respect, the sustainability of these systems appears to depend on how the role of the administrator fits with existing community roles and their respective capacity. Sustainability and the sustainment of interventions appeared therefore to be a more complex matter than simply having a willing volunteer or community champion. Nonetheless, the implications indicate that governance should clearly outline accountabilities as part of community interfacing initiatives as stakeholders will be unlikely to apply accountability themselves.

9.2.1) Concealed burdens

Whilst a single person in control of a system can be beneficial for maintaining consistent operation across a display network, this can prove to be a bottleneck when the network is scaled up. These findings contrast with more romantic view of the community champion who could absorb the burden of operating the Wray Photo Display (comprising 2 displays) by Taylor, *et al*. (2013). Pritchard *et al.* (2014) highlighted the hidden emotional labour that networked public displays can impose on individuals; the responsibility of balancing a diverse administrative role proves stressful and tiring due to fluctuations in workload, time constraints and other personal demands. Administrators presenting themselves as the gatekeepers also inadvertently open themselves up as a point of contact for receiving praise, queries and requests, as well as complaints that can be a precursor to conflict; they also effectively become the sole accountable figurehead for such systems. Similarly, there are hidden financial implications associated with the role of administration that are incurred, such as travel and other costs stemming from engagement with other stakeholders. Reflecting on this, in some respect, the way in which the world café intervention re-configured police officer's role to be someone who helps shape and actuate community ideas into micro-projects, was inconsiderate of the additional burden this would have placed on officers — thereby potentially incurring similar issues experienced by the GleNet and Rothbury network administrators. Given the already ever-changing hectic and stressful day-to-day duties of police officers, it was not

logical to presume they would be an appropriate choice for this role. Even if officers succeeded in leading communities through the crowdfunding process, it will have added significant workload given their lack of familiarity with the mechanisms in place surrounding funding and management of micro-projects. In this regard, the need to properly cater for the distribution of governance by dividing roles and responsibilities becomes a critical aspect to design for, once community-interfacing initiatives and technologies start to scale. Possible governance models need to be considered, discussed and then configured in a way that they can help more fairly distribute the workload across a range of actors; doing this would enable community interfacing interventions to scale appropriately, also by bringing in new actors with the relevant capacity and skills to adopt particular roles.

9.2.2) Emerging tensions

Both longitudinal studies have unearthed how tensions and politics between communities and organizations, and between communities themselves, can unfold over time due to a lack of governance structure. In Northumberland, this was reflected in the moderation of content and the way authority over this was asserted and re-claimed. In both display deployments, governance responsibilities were ultimately transferred to a single individual (*R1* and *G2*) who took on the responsibility for the long-term management, maintenance, sourcing and coordination of content for each network. To date, GleNet remains a static display network which has not grown in scale (in terms of the number of hosts or display nodes), and engagement with it has steadily reduced over time. Its purpose became less clear once its focus was broadened beyond content solely targeted at youth. Intra-community tensions, stemming from perceived `Woolercentricity', resulted in neighbouring communities distancing themselves from the network as they perceived display content to be less inclusive. A consensus emerged that the network had transitioned into a GGT marketing tool that propagated the same perceived inequality and imbalance between Wooler and neighbouring

towns and villages, echoing concerns raised about the amplifying effect of technologies on inequalities (Toyama, 2011). In the police case study, we have seen how there was already an established and distinct hierarchical governance structure in place. However, the world café initiative effectively blurred the lines of what was considered 'staple police practice', suggesting it was approached by officers more informally. Some officers were reluctant to engage in the process and openly mocked it at the training events. At other community events, senior management insisted on stepping in and taking control by demonstrating their authority despite them not engaging in pre-event training. Consequently, officers who had spent time, effort and who had an understanding of the event format were left feeling annoyed, especially when important aspects of world café etiquette were palpably overlooked, which caused tensions to brew between them and the community. Despite there being a clear delineation of the different roles and tasks for how a world café's should be conducted, the lack of appropriate governance in place as part of the initiative allowed senior management to step in and claim the prestige without having completed the necessary prerequisites, to the detriment of the community's experience and other officer's preparation.

Governance needs to be instilled into community interfacing initiatives to provide the necessary protocols and rules for how actors conduct themselves. It cannot be expected that people will automatically apply their own governance, even when they already operate within a governance model themselves. Governance surrounding community interfacing initiatives need to be made explicitly clear and tailored to systems with an outline and protocol defined for how actors should conduct themselves in order to mitigate tensions.

9.2.3) Structured governance, distributed responsibility and accountability

These reflections relate to recent work in HCI on sustaining platforms as commons (Poderi, 2019), which highlight the importance of designed-in governance for the community appropriation and operationalisation of such systems and platforms. In Poderi, 2019, the author

ground the concept in open source software communities and their participation in the governance of such platforms. Therefore, one approach to respond to some of the issues that emerged in the case studies of this thesis, such as alleviating problems of emotional labour and allow for distributed sharing of responsibility, would be to provide stakeholders with a template approach to the organization of the governance of community interfacing operations. This would provide an 'exemplar template' structure that communities and organisations could adopt and adapt. The template would serve to outline role profiles and responsibilities to illustrate how governance can be distributed across a core group of community stakeholders, or in the case of the police, charities and other businesses. Furthermore, given that the distribution of roles across multiple community stakeholders and broader collaborations can sometimes lead to tensions and disagreements, support in the form of template policies of conduct for conflict management and resolution alongside democratic processes, could be provided. However, it should be noted that a 'rigid' templated approach to support communities develop organizational structures and governance, might not be suitable to all communities and could lead to unintended consequences, in particular surrounding perceptions of ownership. For example, while in the context of the world café's, such an approach could have helped giving credit to officers who had facilitated events, as opposed to the senior management; in the context of rural Northumberland, where communities have a much stronger identity and community-led ethos—it could be seen as something 'imposed' from above. However, as we have seen, with the rise of `Woolercentricity', and GleNet being considered less of a community resource, such an approach would have forced stakeholders to recognize the needs of smaller outlying communities. These smaller sub-communities that exist within neighbouring areas received little opportunity to participate in consultation relating to the deployment of the display network. Outside of Wooler, GleNet suffered from a lack of

community ownership and adoption as these communities perceived the display network to be something imposed on them by Wooler.

An alternative approach would have been to scaffold stakeholder engagement to facilitate intra-community discussion and the collaborative configuration of organization and governance in a place-based manner. Thus, we should recognise that it is not enough to develop material resources and 'instructions' – what is also needed is an approach that is mindful of the importance of participation and inclusion of geographical communities who may be marginalised. Although, in turn, this raises questions around the appropriate timings to address such matters in the course of a deployment. In Northumberland, engaging stakeholders during the initial stages could be seen as beneficial for establishing governance processes in the longer-term, however, it carries the risk of deterring interested stakeholders in a potentially heavy bureaucratic deliberation process, as well trying to engage stakeholders without them fully comprehending how the initiative might be used going forward. Engaging stakeholders at a later stage allows people to understand how the public displays will be used and to configure governance accordingly. However, as we saw with both GleNet and CoNet, at a later stage there can be far fewer stakeholders willing to engage. In the case of the police, it's evident that governance outlines would be highly beneficial from the outset given the operational working culture of public institutions and how they operate using traditional hierarchical structures. In line with prior literature that has recommended a focus on the "human and social infrastructure" (Hearn *et al.*, 2005), designing for governance would help to both distribute the range of roles of management; but would also be a means of spreading the emotional cost from a single individual to a core group to mitigate the hidden and emotional costs of administration and support. Such reflections, namely the need to be attentive to governance and ownership and to engage stakeholders in intra-community discussions by designing for a "human and social infrastructure" (Hearn *et al.*, 2005) of any technological system (in our case the display

networks), also point to work that explores the role of participatory, and in our case, technology design for creating 'new institutions' (Huybrechts, Benesch and Geib, 2017). Building on recent calls for design approaches that bring local initiatives and communities in dialogue with institutional framing processes (Huybrechts, Benesch and Geib, 2017), these insights point to the need for designers and researchers to be proactive in creating novel institutional processes, especially in relation to governance and operations. Without accountability, governance practices can emerge and become established but inevitably serve the purpose of the initiators of the community system. Whilst this may be desirable at the outset, it frustrates aspects of adoption, use and ultimately degrades sustainability.

9.3) What are the challenges and opportunities associated with adoption in sustainable community technologies?

During both case studies, the aim was for the community interfacing initiatives to be adopted as part of their respective communities and practices. The deployments of GleNet and CoNet in rural Northumberland demonstrate how perseverance of individual champions and my early efforts played a role in fostering adoption. However, in practice more work was needed to ensure its sustainability. Here I reflect on the process of working with police and the administrators of CoNet and GleNet, and demonstrate the need to align the activities around public displays to common practices and working cultures, as well as utilising actors' strengths, existing skills and knowledge from within the community. I also demonstrated the importance of transparency and the promotion of trust through the operation of display technology in order to foster adoption and sustainable use.

This work confirms the conclusions of previous studies as to the importance of designing for intra-community organizational relationships (Taylor and Cheverst, 2010b) (i.e. between GGT, police, NGO's, businesses and community groups). For display networks in particular, it points to a need to take a more explicit account of governance design (as outlined

in 5.8), including other longer-term implications for the running of community interfacing initiatives, such as: how administration roles and content moderation functions can be distributed between stakeholders who are not co-located; who could and should be the responsible person(s) for node maintenance, who is responsible if inappropriate content is published to a node or who is the most appropriate actor to broker. For police, a more appropriate choice of broker in their situation would be locally established organisations, and charities that have firmer grasp of the intricacies of establishing, shaping and navigating community funding pathways, as well as the experience of managing volunteers and interested stakeholders. By relieving officers of the pressure of piecing communities' ideas and projects together, officers can instead place greater emphasis and energy into mapping their own knowledge of organisations in the local area and use that knowledge to broker new connections and relations within communities. This approach would require police to consider local businesses and other community groups in the area as an asset, which they can link in with, rather than trying to understand world café's through an issue or problem-based approach. This inspires a turn towards utilising existing capacities, where upon such initiatives should set out to build on and enhance existing capabilities from within the communities. An example of this in practice was demonstrated by CoNet's administrator (*R1*) who had the capacity and the capability to run the display network through their own technical knowledge and expertise whereas GleNet's administrator had the capacity, but not the capability which took time to develop. Building community capacity is a major aspect of Participatory Design processes and HCI work concerned with supporting community actions with and through technology (Clement *et al.*, 2012; Geppert, 2014; Le Dantec, 2017). It is also a way to ensure the sustainability of HCI interventions, for example; Geppert (Geppert, 2014) notes the importance of community capacity building as a means of sustaining solutions responsive to community needs; an empowering process to preserve community adoption and long-term involvement.

To promote adoption of community interfacing initiatives, there needs to either be consideration placed on built-in mechanisms which explore and utilise existing capabilities to share the operational load and distribution of tasks and roles, or a way of developing people's capability in the required areas of expertise in order to sustain the operation of community interfacing initiatives longitudinally. Deploying systems and expecting actors to self-organise around them by sourcing expertise is not a process which occurs naturally and as demonstrated, communities can be very short-sighted when they think about making use of what capabilities (or assets) are available to them.

9.3.1) Asset mapping

The ability to re-frame the way in which a community considers their existing resources and relationships as assets will require them to engage in reflective practices to be able to map them. To a limited extent, established organisations such as the police, will be familiar with this practice at a high managerial level, however this would not necessarily be a practice with which regular neighbourhood officer or proactive members of a rural community would be aware of. However, regardless of being able to reflect, which is definitely an advantageous practice which should be employed as part of capability building (more in 9.4), it raises the question of how community interfacing initiatives fit in with what is considered the 'normal' routines, working practices and cultures in any given context and community. In Northumberland, two iterations of action research took place to configure networked public displays appropriately around the communities of Glendale given the unique characteristics and behaviour of rural communities (Taylor *et al.*, 2012). In this case study, the first iteration of GleNet was designed alongside stakeholders for the specific purpose of engaging youth, and then later adopted as Showboater to a more generic tool for digital information distribution which generally serves their respective communities well and has been accepted over time. In contrast, the world café training package for neighbourhood officers raised concerns over the

format and integration of the training programme. Greater steps could have been taken to integrate the training into organisational working practices, in this case by better taking account of neighbourhood officers' existing role and responsibilities, and the standard way of delivery their services. The misalignment between the world café programme and daily police practice caused disengagement, lack of interest and impacted on officer's longitudinal outlook of the initiative. When introducing community facing initiatives and technologies (public displays) to organisations with rigid working practices, rules, roles and responsibilities, these processes must integrate with current working practices to instil a sense of permanence, purpose and as a way of incentivising them for longer-term adoption. Interestingly, officers were still willing to engage in the process of world café engagement, which demonstrates that at some level there is also opportunity to innovate within the rigid boundaries of such organisations. Previous work documents the difficulties in innovating institutional culture with and through technological interventions (Le Dantec and DiSalvo, 2013; Crivellaro *et al.*, 2019) due to set roles, entrenched routines of working, combined with the necessity to retain control and authority over a process. Clearly there are some hurdles to overcome, and it would be unrealistic to expect working practices and perceptions to change overnight; yet the fact that the world café process has been adopted and accepted so widely within the police, is certainly significant.

9.3.2) Building and maintaining trust

A further critical element for community technologies, demonstrated through both case studies, is the subtler requirement of actively demonstrating and fostering care and transparency in order to promote trust. In the second case study, simple aspects such as officers wearing uniform or otherwise, showing care in preparing and hosting the world café events, actually had a dramatic impact on the success of the events. At times, tensions appeared to stem from the presence of a controlling authority (represented by officers in uniform) in the room which was reminiscent of police-community exchanges more similar to traditional methods of police-

community engagement (PACT meetings); at other times community members simply perceived it as a lack of care, effort and commitment towards them and simply disengaged with the process, such as what happened at the Beacon Lough East follow up event (7.3.1). The establishment of Rothbury's CoNet was made up of engagement with the local community for the establishment of an identity for the network, it was launched publicly at the Rothbury music festival, received multiple publications in the local newsletter and had operational policies and protocols defined for how it would be used. The transparency demonstrated at the early stages of development and through the displays continued operation serves as testament to its successful adoption in Rothbury. In contrast, GGT did little community consultation, has no policy or procedure for operation and there is limited information available surrounding who manages the system, it's purpose or where nodes are located. Previous work highlighted how a productive and constructive participatory process requires a certain degree of trust between participants and hosts (Harding *et al.*, 2015; Crivellaro *et al.*, 2019); others have stressed the difficulties of recovering trust in the relations between communities and institutions. Here, Corbett and Le Dantec. (2018b) looked at the miss-match between expectations, realities and outcomes as one of the causes for mistrust between communities and public institutions. The importance of demonstrating care and effort through engagement has also been raised by Gaver, et al. (1999) as part of a larger body of design practice. The work conducted in both case studies highlights the subtler aspect of the need to actively illustrate care and effort in the preparation, introduction and operation of community-facing initiatives and processes to develop, promote or reinforce a sense of trust and openness.

9.3.3) Community self-reflection

It is difficult to generalise a single solution for how it is possible to design in a way that encourages adoption in the future due to the application of community interfacing initiatives and how this can vary in different contexts. However, from the insights presented in this

dissertation, we can conclude that foregrounding principles such as transparency, organisational capacity and working culture in the technology design process can play a meaningful role in encouraging adoption. While many organisations (such as GGT, Northumbria Police and NGO's) operate under the assumption that their day-today operations appear as transparent to community members, in reality this may not be how they are perceived by the wider public. In practice, approaching organisations and probing their working culture and practices to unpick and question the degree to which their practices can be considered transparent, is important yet, not a trivial matter. Given they struggle to recognise their own lack of transparency, they will also struggle to recognise the need to open organisational borders as to enable other actors to get involved in the activity. Organisations such as the ones I have engaged with over the course of my PhD, appear to be lacking opportunities and mechanisms to reflect critically about their own working culture and working practices, also in relation to issues such as transparency. Whereas, large NGO's, may have the resources to implement mechanisms for organisational self- reflection, small NGO's (as the ones in Northumberland) may not have the capacity or resources to do so and therefore their assumptions remained unchallenged. On the other hand, public funded large institutions such as the police that do have accountability mechanisms in place, they struggle with transparency for a number of different reasons which stem from the complex domain of law enforcement in which they are situated. In some respect, novel interfacing initiatives and systems help bring to the surface these issues and point to the need for designers to carefully open spaces where public institutions or third sectors organisation can question and examine their existing working cultures and practices (including their ability to be more transparent about these) more critically as part of the design process. This would open opportunities for these organisations and institutions to also consider codes of ethics in their practices and remind themselves about the

role they play within society, and the courteousness they are required to portray as an actor in their public-facing role.

9.4) Future Work: designing for capability

Designers who consider deploying technology in a social context to facilitate new community activities, often assume that the communities will be able to employ their existing capabilities assumed to be in place (Oosterlaken, 2009). With that, it's almost expected that technology will allow such capabilities to emerge as part of the use of such community interfacing initiatives. This however is far from the reality, and such assumptions have a significant impact on the use and adoption (or otherwise) of a technology and its perceived 'success'. Often only few individuals with the capabilities required to use the technology, end up reaping its benefits, or run the risk of initiating and running everything themselves, becoming overburdened. This is one of the ideas put forward by Taylor *et al.* (2013) when they talk about community champions who can benefit from technologies by utilising their own technological capabilities and capacity. However, as evidenced through the case studies presented in this dissertation, such individuals may not necessarily possess the 'know-how' and capabilities required to conduct and sustain effective governance practices and access the resources (financial, human etc in form of grant applications for example.) that enable the sustainability of a community interfacing infrastructure in the long run. Based on the insights stemming from this work, the argument put forward is therefore that in order to support sustainable community interfaces, we must design for '*capabilities'*—that is that we must foreground design approaches that takes into consideration the development of human capabilities—understood as the effective resources and opportunities for people to achieve what they value being and doing (Robeyns, 2005).

9.4.1) Developing community competencies

As I have discussed in the previous sections, designers should consider developing resources to support communities and institutions develop their own governance mechanisms, processes and structures (e.g. roles, responsibilities and accountability) for community interfacing initiatives and technologies, through templates to a limited extent. Yet, the pragmatic micro, day-to-day activities involved in enacting governance may still be unknown or misunderstood. Micro, day-to-day activities such as ways of communicating and the expected and appropriate etiquette, the necessity to record meetings, taking notes and meeting minutes, coordinate and correspond with other actors and general logistics may form the competencies, which if given opportunities to practice them help create capabilities. This is a critical aspect that should not be overlooked as part of this process. Outlining individual, collective (and therefore relational) competencies in regard to knowledge, skills and behaviours as part of a governance competencies framework would be an appropriate approach to unearth these hidden capability needs. For example, this may practically take the form of a governance competencies framework, similar to what the Department for Education has implemented for outlining aspects of leadership, accountability, teamwork, roles, compliance and evaluation (Department for Education, 2017) as a way of outlining governance literacy. Similarly, if resources and templates for governance of communities' interfaces are developed and provided, as recommended, there will still need to be some reflection and oversight in terms of ensuring the governance structure is effective and followed through to an adequate standard. In this sense, technology can and should be designed so that it serves as a vehicle for capability expansion (Sen, 2005; Oosterlaken, 2009).

9.4.2) Configuring resources into community action

As demonstrated in case study two, providing access to resources alone was not enough to effectively enabling police officers and communities to turn them into valuable 'functioning'—they needed to understand how these resources could be used in practice; they also needed the additional social resources that would enable them to turn ideas and funds into community actions. Robyns' notes that resource provision does not lead to increased capability (Robeyns, 2005), which is precisely the assumption that underscored the world café study when financial resources were secured for officers and communities to utilise. The capabilities required for turning resources into actions (or functioning) also necessitates that existing resources in communities are seen as assets that can used for particular purposes, as opposed to 'problems'. Instead, more often than not, police officers "see" communities as made up of problems to solve as opposed to potential resources that need support to be activated. Also, significant if the need to support capabilities to enable access to resources and the micro-activities that are associated with the formalities of trying to reach out and obtain a resource. For example, applying for grant funding would require organisation of actors to outline who is leading, the problem area to be tackled, an approach methodology, how collaboration would take shape with other NGO's and how outcomes or impact could be measured.

As demonstrated through the work completed in this thesis, sustaining community interfaces and technologies relies upon a number of relational factors. However, what is critical is the provision of resources (social and material) and opportunities that enable people to turn these into actions (e.g. supporting and sustaining human capabilities) that can ensure long-term adoption and operation (governance and resourcing) of a community interfacing initiatives and technologies. Reflecting on the pivotal role that particular individuals played in enabling the ongoing administration and maintenance of Showboater's two display networks, it would reasonable to think that should they leave their role, the network itself would stop functioning.

In this sense, what is also critical is to design in a way that build capacities for community members to knowledge exchange and support each other's capabilities development. For Northumbria Police, the world café training programme was a glimmer of innovation in a traditional and rigidly structured institution which would further require design iterations to build-in capability requirements for new and genuinely impactful and sustainable forms of community engagement.

10) References

Abdulgalimov, D. *et al.* (2020) 'Designing for Employee Voice', *arXiv*. doi: 10.1145/3313831.3376284.

Abras, C., Maloney-Krichmar, D. and Preece, J. (2004) 'User-centered design'.

Alt, F., Memarovic, N., *et al.* (2011) 'Designing shared public display networks - Implications from today's paper-based notice areas', *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 6696 LNCS, pp. 258–275. doi: 10.1007/978-3-642-21726-5_17.

Alt, F., Kubitza, T., *et al.* (2011) 'Digifieds', *Proceedings of the 10th International Conference on Mobile and Ubiquitous Multimedia - MUM '11*, pp. 165–174. doi: 10.1145/2107596.2107618.

Arnold, J. and Smith, J. (2009) *Local authority responses to economic downturn*. Available at: https://cles.org.uk/wp-content/uploads/2011/01/RR14-Economic-downturn.pdf (Accessed: 11 January 2021).

Baldauf, M. and Fröhlich, P. (2013) 'The Augmented Video Wall: Multi-user AR Interaction With Public Displays', *Conference on Human Factors in Computing Systems - Proceedings*, 2013-April, pp. 3015–3018. doi: 10.1145/2468356.2479599.

Balestrini, M. *et al.* (2014) 'Understanding sustained community engagement: A case study in heritage preservation in rural Argentina', *Conference on Human Factors in Computing Systems - Proceedings*, pp. 2675–2684. doi: 10.1145/2556288.2557323.

Beck, K. *et al.* (2001) 'Manifesto for Agile Software Development', *The Agile Alliance*, pp. 12–14. Available at: http://agilemanifesto.org/.

Björgvinsson, E., Ehn, P. and Hillgren, P. A. (2010) 'Participatory design and "democratizing innovation"', *ACM International Conference Proceeding Series*, (Ehn 1988), pp. 41–50. doi: 10.1145/1900441.1900448.

Blaug, M. (1964) 'The Poor Law Report Reexamined', 24(2), pp. 229–245.

Bowker, G. C. *et al.* (2010) 'International Handbook of Internet Research', *International Handbook of Internet Research*, (June 2014). doi: 10.1007/978-1-4020-9789-8.

Braun, V. and Clarke, V. (2006) 'Using thematic analysis in psychology', *Global Shadows: Africa in the Neoliberal World Order*, 44(2), pp. 8–10.

Braun, V. and Clarke, V. (2012) 'Thematic analysis.pdf'. American Psychological Association.

Brown, N. (2021) *Cuts to Northumbria Police*. Available at:
https://www.nickbrownmp.com/2019/03/13/179/ (Accessed: 24 January 2021).

Bureau of Justice Assistance (1994) 'Understanding Community Policing: A framwork for action', *Juvenile Justice*, pp. 1–82. Available at: https://www.ncjrs.gov/pdffiles/commp.pdf.

Carroll, J. M. (2001) 'Community computing as human - computer interaction Community computing as human ± computer interaction', 20(5), pp. 307–314. doi: 10.1080/0144929011007894.

Carroll, J. M. and Rosson, M. B. (2007) 'Participatory design in community informatics', 28, pp. 243–261. doi: 10.1016/j.destud.2007.02.007.

Carroll, J. M. and Rosson, M. B. (2013) 'Wild at home: The neighborhood as a living laboratory for HCI', *ACM Transactions on Computer-Human Interaction*, 20(3). doi: 10.1145/2491500.2491504.

Centre for Local Economic Strategies (2014) 'A SUMMARY OF AUSTERITY IN THE NORTH EAST AND A CASE STUDY OF REDCAR AND CLEVELAND BOROUGH COUNCIL', (4242937). Available at: https://www.tuc.org.uk/sites/default/files/North East Final Report_0.pdf.

Centre for Rural Economy (2014) 'Reimagining the rural: What's missing in UK rural policy?', p. 12. Available at: The Centre for Rural Economy was founded as a Newcastle University Research Centre in%0A1992. It specialises in interdisciplinary social science and applied policy research oriented%0Atowards achieving sustainable rural economies and societies in the UK a.

Cheverst, K. *et al.* (2003) 'Exploring the utility of remote messaging and situated office door displays', *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 2795, pp. 336–341. doi: 10.1007/978-3-540-45233-1_24.

Chin, G. and Rosson, M. B. (1998) 'Progressive design: Staged evolution of scenarios in the design of a collaborative science learning environment', *Conference on Human Factors in Computing Systems - Proceedings*, (April), pp. 611–618.

Churchill, E. *et al.* (2004) 'Blending digital and physical spaces for ubiquitous community participation', *Communications of the ACM*, 47(2), pp. 38–44. doi: 10.1145/966389.966413.

Churchill, E. F. *et al.* (2003) 'The Plasma Poster Network: Posting Multimedia Content in Public Places', *Proceedings of the 9th IFIP TC13 International Conference on Human-Computer Interaction (INTERACT'03)*, (September), pp. 599–606.

Clement, A. *et al.* (2012) 'Probing, mocking and prototyping: participatory approaches to

identity infrastructuring', *Pdc '12*, pp. 21–30. doi: 10.1145/2347635.2347639.

Clinch, S. *et al.* (2011) 'Reflections on the long-term use of an experimental digital signage system', *UbiComp'11 - Proceedings of the 2011 ACM Conference on Ubiquitous Computing*, pp. 133–142. doi: 10.1145/2030112.2030132.

Clinch, S. (2013) 'Smartphones Smartphones and Pervasive', pp. 92–95.

Clinch, S. *et al.* (2013) 'Yarely: a software player for open pervasive display networks', *Proceedings of the 2nd ACM International Symposium on Pervasive Displays - PerDis '13*, p. 25. doi: 10.1145/2491568.2491575.

CLLD (2018) *North of Tyne Community Led Local Development*. Available at: https://northoftyneclld.weebly.com/what-is-clld.html (Accessed: 18 February 2021).

Cockburn, A. and Highsmith, J. (2001) 'Agile Software Development: The People Factor', (November), pp. 131–133.

College of Policing (2013) 'Becoming a Special Constable', pp. 0–25. Available at: https://www.college.police.uk/What-we-do/Support/Citizens/Special-Constabulary/Documents/Special_Constable_Recruitment_Brochure.pdf.

College of Policing (2020a) *Definition of Neighbourhood Policing*. Available at: https://www.college.police.uk/What-we-do/Standards/Guidelines/Neighbourhood-Policing/Pages/definition-of-neighbourhood-policing.aspx.

College of Policing (2020b) *Neighbourhood Policing Constable*. Available at: https://profdev.college.police.uk/professional-profile/neighbourhood-policing-constable/ (Accessed: 16 January 2021).

Corbett, E. and Le Dantec, C. A. (2018a) 'Exploring trust in digital civics', *DIS 2018 - Proceedings of the 2018 Designing Interactive Systems Conference*, pp. 9–20. doi: 10.1145/3196709.3196715.

Corbett, E. and Le Dantec, C. A. (2018b) 'The Problem of Community Engagement: Disentangling the Practices of Municipal Government', pp. 1–13. doi: 10.1145/3173574.3174148.

Crivellaro, C., Taylor, A., Vlachokyriakos, Vasilis, *et al.* (2016) 'Re-making places: HCI, "community building" and change', *Conference on Human Factors in Computing Systems - Proceedings*, pp. 2958–2969. doi: 10.1145/2858036.2858332.

Crivellaro, C., Taylor, A., Vlachokyriakos, Vasillis, *et al.* (2016) 'Re-Making Places', pp. 2958–2969. doi: 10.1145/2858036.2858332.

Crivellaro, C. *et al.* (2019) 'Infrastructuring public service transformation: Creating collaborative spaces between communities and institutions through HCI research', *ACM*

Transactions on Computer-Human Interaction, 26(3). doi: 10.1145/3310284.

Crosby, A. (2012) 'Aktivisme Desain di Suatu Kampung Indonesia', (July). doi: 10.1162/DESI.

Cuthbertson, P. (2018) 'Poverty and Crime: Why a new war on criminals would help the poor most', *Civitas*, (July), pp. 1–19.

Dalton, N. S., Collins, E. and Marshall, P. (2015) 'Display blindness? Looking again at the visibility of situated displays using eye tracking', *Conference on Human Factors in Computing Systems - Proceedings*, 2015-April(5), pp. 3889–3898. doi: 10.1145/2702123.2702150.

Le Dantec, C. A. (2017) 'Design through collective action/collective action through design', *Interactions*, 24(1), pp. 24–30. doi: 10.1145/3018005.

le Dantec, C. A. and DiSalvo, C. (2013) 'Infrastructuring and the formation of publics in participatory design', *Social Studies of Science*, 43(2), pp. 241–264. doi: 10.1177/0306312712471581.

Le Dantec, C. A. and DiSalvo, C. (2013) 'Infrastructuring and the formation of publics in participatory design', *Social Studies of Science*, 43(2), pp. 241–264. doi: 10.1177/0306312712471581.

Le Dantec, C. A. and Fox, S. (2015) 'Strangers at the Gate: Gaining access, building rapport, and co-constructing community-based research', *CSCW 2015 - Proceedings of the 2015 ACM International Conference on Computer-Supported Cooperative Work and Social Computing*, pp. 1348–1358. doi: 10.1145/2675133.2675147.

Le Dantec, C. (2012) 'Participation and publics', p. 1351. doi: 10.1145/2207676.2208593.

Defra (2017) 'Rural proofing: Practical guidance to assess impacts of policies on rural areas', (March), p. 25. Available at: www.nationalarchives.gov.uk/doc/open-government-licence/version/3/oremailPSI@nationalarchives.gsi.gov.uk%0Awww.nationalarchives.gov.uk/doc/open-government-licence/version/3/.

DEFRA (2020) 'Statistical Digest of Rural England, August 2020 Edition', (November). Available at: www.nationalarchives.gov.uk/doc/open-government-licence/version/3/oremailPSI@nationalarchives.gsi.gov.ukwww.gov.uk/defra.

Department for Communities and Local Government (2011) 'Neighbourhoods statistical release: The English Indices of Deprivation 2010', *Neighbourhoods Statistical Release*, pp. 1–20. Available at: http://www.communities.gov.uk/publications/corporate/statistics/indices2010technicalreport.

Department for Communities and Local Government (2016) 'The English Indices of

Deprivation 2015 - Frequently Asked Questions (FAQ's)', pp. 1–21. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/579151/English_Indices_of_Deprivation_2015_-_Frequently_Asked_Questions_Dec_2016.pdf.

Department for Education (2017) 'A Competency Framework for Governance: The knowledge, skills and behaviours needed for effective governance in maintained schools, academies and multi-academy trusts', (January), pp. 1–27.

Deway, J. (1927) 'The Public and its Problems', *Holt, New York*.

Dingler, T. and Schmidt, A. (2015) 'A Real-Time Bidding Platform for Public Displays', *Proceedings of the 4th International Symposium on Pervasive Displays - PerDis '15*, pp. 245–246. doi: 10.1145/2757710.2776804.

DiSalvo, C. (2009) 'Design and the construction of publics', *Design Issues*, 25(1), pp. 48–63. doi: 10.1162/desi.2009.25.1.48.

DiSalvo, C., Maki, J. and Martin, N. (2007) 'Mapmover: A case study of design-oriented research into collective expression and constructed publics', *Conference on Human Factors in Computing Systems - Proceedings*, pp. 1249–1252. doi: 10.1145/1240624.1240813.

Dodds, C. *et al.* (2017) 'Remix portal: Connecting classrooms with local music communities', *ACM International Conference Proceeding Series*, Part F1285, pp. 203–212. doi: 10.1145/3083671.3083679.

Dreessen, K. and Schepers, S. (2020) 'Shifting towards community-building in opening up FabLabs for non-expert users', *Strategic Design Research Journal*, 13(1). doi: 10.4013/sdrj.2020.131.03.

Du, G. *et al.* (2016) 'Comparing two methods to overcome interaction blindness on public displays', *PerDis 2016 - Proceedings of the 5th ACM International Symposium on Pervasive Displays*, pp. 243–244. doi: 10.1145/2914920.2940339.

Duarte, E. F. and Baranauskas, M. C. C. (2016) 'Revisiting the three HCI waves: A preliminary discussion on philosophy of science and research paradigms', *ACM International Conference Proceeding Series*, Part F128046(October). doi: 10.1145/3033701.3033740.

Ehn, P. (2008) 'Participation in Design Things', *Design Things*. doi: 10.7551/mitpress/8262.003.0011.

Eksteen, S. *et al.* (2019) 'Hearing and vision screening for preschool children using mobile technology, south africa', *Bulletin of the World Health Organization*, 97(10), pp. 672–680. doi: 10.2471/BLT.18.227876.

Fiegehen, G. C., Lansley, P. S. and Smith, A. D. (1977) 'Poverty and Progress In Britain

1953-1973', *Journal of European Economic History*, 8(33). Available at: https://search.proquest.com/openview/2a279be0340b667117d462ec502d47ea/1/advanced.

Flanagan, R. (2008) 'The Review of Policing: Final Report', *the Home Secretary and Conducted By Sir Ronnie Flanagan*, pp. 1–115. Available at: https://www.justiceinspectorates.gov.uk/hmicfrs/media/flanagan-review-of-policing-20080201.pdf.

Full speed ahead! (2013). Available at: https://newsroom.bt.com/full-speed-ahead-rothbury-becomes-first-uk-community-to-go-superfast-using-the-governments-rural-community-broadband-fund/ (Accessed: 2 January 2021).

Gaver, B., Dunne, T. and Pacenti, E. (1999) 'Design: Cultural probes', *Interactions*, 6(1), pp. 21–29. doi: 10.1145/291224.291235.

Geppert, A. A. (2014) 'Co-design for community capacity building', *ACM International Conference Proceeding Series*, 2, pp. 251–254. doi: 10.1145/2662155.2662247.

Goffman, E. (2016) *The presentation of self in everyday life*, *Social Theory Re-Wired: New Connections to Classical and Contemporary Perspectives: Second Edition*. Harmondsworth London. doi: 10.4324/9781315775357.

Gomart, E. and Hennion, A. (1999) 'A Sociology of Attachment: Music Amateurs, Drug Users', *The Sociological Review*, 47(1_suppl), pp. 220–247. doi: 10.1111/j.1467-954x.1999.tb03490.x.

Greater Manchester Police (2017) 'Incident Response Policy', pp. 1–12. Available at: https://www.gmp.police.uk/SysSiteAssets/foi-media/greater-manchester/policies/incident-response-policy-v1.3-july-2017-redacted.pdf.

Greenwood, D. . and Levin, M. (2007) 'Introduction to Action Research', 1, pp. 1–7.

Gripsrud, I. *et al.* (2010) *The Idea of the Public Sphere. A Reader*. Lexington books.

Harding, M. *et al.* (2015) 'HCI, civic engagement & trust', *Conference on Human Factors in Computing Systems - Proceedings*, 2015-April, pp. 2833–2842. doi: 10.1145/2702123.2702255.

Harper, R. H. R. (2000) 'The Organisation in Ethnography: A Discussion of Ethnographic Fieldwork Programs in CSCW', *Computer Supported Cooperative Work*, 9, pp. 239–264.

Hayes, G. R. (2011) 'The relationship of action research to human-computer interaction', *ACM Transactions on Computer-Human Interaction*, 18(3), pp. 1–20. doi: 10.1145/1993060.1993065.

Hearn, G. *et al.* (2005) 'A Way Forward: Sustainable ICTs and Regional sustainability', *The Journal of Community Informatics*, 1(2), pp. 18–31. doi: 10.15353/joci.v1i2.2041.

Higgins, A. (2017) *Core functions: the real value of neighbourhood policing*. Available at: http://www.police-foundation.org.uk/2017/02/core-functions-the-real-value-of-neighbourhood-policing/#:~:text=When done well%2C neighbourhood policing,to develop personal relationships with (Accessed: 14 January 2021).

HMIC (2012a) 'One year on: Northumbria Police', *Scientist*, 26(3), pp. 1–12.

HMIC (2012b) *Policing in Austerity*. Available at: https://www.politics.co.uk/reference/police-numbers-and-recruitment/.

Hosio, S. *et al.* (2014) 'What's in it for me: Exploring the real-world value proposition of pervasive displays', *PerDis 2014 - Proceedings: 3rd ACM International Symposium on Pervasive Displays 2014*, pp. 174–179. doi: 10.1145/2611009.2611012.

Huybrechts, L., Benesch, H. and Geib, J. (2017) 'Institutioning: Participatory Design, Co-Design and the public realm', *CoDesign*, 13(3), pp. 148–159. doi: 10.1080/15710882.2017.1355006.

iNorthumberland (2014). Available at: http://www.inorthumberland.org.uk/superfast-broadband-now-available-in-wooler/ (Accessed: 2 January 2021).

Institute for Government (2019) *Performance Tracker*. Available at: https://www.instituteforgovernment.org.uk/publication/performance-tracker-2019/police (Accessed: 16 January 2021).

Izadi, S. *et al.* (2005) 'The iterative design and study of a large display for shared and sociable spaces', *ACM International Conference Proceeding Series*.

Jones, M. *et al.* (2008) '"Narrowcast yourself": Designing for community storytelling in a rural indian context', *Proceedings of the Conference on Designing Interactive Systems: Processes, Practices, Methods, and Techniques, DIS*, pp. 369–378. doi: 10.1145/1394445.1394485.

Jones, S. and Marsh, S. (1997) 'Human-Computer-Human Interaction Trust in CSCW', (July), pp. 36–40.

Joseph Rowntree Charitable Trust (2004) 'The Joseph Rowntree Inheritance'.

Karasti, H. (2014) 'Infrastructuring in participatory design', *ACM International Conference Proceeding Series*, 1, pp. 141–150. doi: 10.1145/2661435.2661450.

Karasti, H., Baker, K. S. and Halkola, E. (2006) 'Enriching the notion of data curation in e-Science: Data managing and information infrastructuring in the Long Term Ecological Research (LTER) network', *Computer Supported Cooperative Work*, 15(4), pp. 321–358. doi: 10.1007/s10606-006-9023-2.

Karasti, H. and Syrjänen, A. L. (2004) 'Artful infrastructuring in two cases of community

PD', *PDC 2004 - Proceedings of the Eight Participatory Design Conference 2004 - Artful Integration: Interweaving Media, Materials and Practices*, (January 2004), pp. 20–30. doi: 10.1145/1011870.1011874.

Kavanaugh, A. (2012) 'Blacksburg Electronic Village', *Leadership in Science and Technology: A Reference Handbook*, 39(5), pp. 593–601. doi: 10.4135/9781412994231.n67.

Klaebe, H. *et al.* (2007) 'Digital Storytelling and History Lines: Community Engagement in a Master-Planned Development', *In Docherty, M (Ed.) Proceedings of the 13th International Conference on Virtual Systems and Multimedia.*, pp. 108–120. Available at: https://www.rfc-editor.org/rfc/rfc8309.txt%0Ahttp://publicacoes.cardiol.br/portal/ijcs/portugues/2018/v3103/pdf/3103009.pdf%0Ahttp://www.scielo.org.co/scielo.php?script=sci_arttext&pid=S0121-75772018000200067&lng=en&tlng=en&SID=5BQIj3a2MLaWUV4OizE%0Ahttp:

Kleinhans, R. *et al.* (2020) 'Exploring the durability of community businesses in England', (May).

Kock, N. and Texas, A. (2015) 'Using Action Research to Study E-Collaboration'.

Lambton-Howard, D. *et al.* (2019) 'Whatfutures: Designing large-scale engagements on Whatsapp', *Conference on Human Factors in Computing Systems - Proceedings*, (April). doi: 10.1145/3290605.3300389.

Lankton, N. K., Mcknight, D. H. and Tripp, J. (2015) 'Journal of the Association for Information Technology , Humanness , and Trust : Rethinking Trust in Technology', *Journal of the Association for Information systems*, 16(10), pp. 880–918.

Law Enforcement Action Partnership (no date) *Sir Robert Peel's Policing Principles*. Available at: https://lawenforcementactionpartnership.org/peel-policing-principles/ (Accessed: 16 January 2021).

Lee, E. (2002) 'Factors That Enhance Consumer Trust in Human- Computer Interaction : An Examination of Interface Factors and Moderating Influences'.

Lévesque, M., Bélanger, L. and Lewis, J. E. (2006) 'p2P : Cityspeak ' s Reconfiguration of Public Media Space', (January).

Longstaff, A. *et al.* (2015) 'Neighbourhood policing: Past, present and future A review of the literature', *The Police Foundation*, (May). doi: 10.13140/RG.2.1.1731.9844.

Marres, N. (2007) 'The issues deserve more credit: Pragmatist contributions to the study of public involvement in controversy', *Social Studies of Science*, 37(5), pp. 759–780. doi: 10.1177/0306312706077367.

Marsden, G. (2006) 'Designing technology for the developing world', *Interactions*, 13(2), pp. 0–1. doi: 10.1145/1116715.1116743.

Marsden, G., Maunder, A. and Parker, M. (2008) 'People are people, but technology is not technology', *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 366(1881), pp. 3795–3804. doi: 10.1098/rsta.2008.0119.

Maunder, A., Marsden, G. and Harper, R. (2011) 'Making the link - Providing mobile media for novice communities in the developing world', *International Journal of Human Computer Studies*, 69(10), pp. 647–657. doi: 10.1016/j.ijhcs.2010.12.009.

McCarthy, J. and Wright, P. (2004) 'Technology as experience', *Interactions*, 11(5), pp. 42–43. doi: 10.1145/1015530.1015549.

McMillan, D. W. and Chavis, D. M. (1986) 'Sense of community: A definition and theory', *Journal of Community Psychology*, 14(1), pp. 6–23. doi: 10.1002/1520-6629(198601)14:1<6::AID-JCOP2290140103>3.0.CO;2-I.

Mctaggart, R. (1994) 'Participatory Action Research : issues in theory and practice', 0792. doi: 10.1080/0965079940020302.

Memarovic, N. *et al.* (2012) 'Designing "interacting places" for a student community using a communicative ecology approach', *Proceedings of the 11th International Conference on Mobile and Ubiquitous Multimedia, MUM 2012*. doi: 10.1145/2406367.2406420.

Memarovic, N. *et al.* (2013) 'P-LAYERS -- A Layered Framework Addressing the Multifaceted Issues Facing Community-Supporting Public Display Deployments', *ACM Transactions on Computer-Human Interaction*, 20(3), pp. 1–34. doi: 10.1145/2491500.2491505.

Merkel, C. B. *et al.* (2004) 'Participatory design in community computing contexts: Tales from the field', *PDC 2004 - Proceedings of the Eight Participatory Design Conference 2004 - Artful Integration: Interweaving Media, Materials and Practices*, pp. 1–10.

Ministry of Housing Communities and Local Government (2019) 'The English Indices of Deprivation 2019', *Ministry of Housing, Communities & Local Government*, 2019. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/835115/IoD2019_Statistical_Release.pdf.

Müller, J. *et al.* (2009) 'Display blindness: The effect of expectations on attention towards digital signage', *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 5538 LNCS(May), pp. 1–8. doi: 10.1007/978-3-642-01516-8_1.

Muller, J. and Kruger, A. (2009) *MobiDiC: Context Adaptive Digital Signage with Coupons.*

Mutual Gain (2021) *Mutual Gain: About Us.*

Neumann, L. J. and Star, S. L. (1996) 'Making Infrastructure : The Dream of a Common Language', *PDC'96 Proceedings of the Participatory Design Conference*, pp. 231–240.

Nicholson, S. *et al.* (2019) 'Showboater: Insight into sustainable rural community display networks from a longitudinal study', *Proceedings - Pervasive Displays 2019 - 8th ACM International Symposium on Pervasive Displays, PerDis 2019*, 2. doi: 10.1145/3321335.3324948.

O'Hara, K., Perry, M. and Lewis, S. (2003) 'Social coordination around a situated display appliance', *New Horizons*, (5), pp. 65–72.

Ojala, T. *et al.* (2010) 'UBI-hotspot 1.0: Large-scale long-term deployment of interactive public displays in a city center', *5th International Conference on Internet and Web Applications and Services, ICIW 2010*, (May 2014), pp. 285–294. doi: 10.1109/ICIW.2010.49.

Ojala, T. and Kostakos, V. (2011) 'UBI challenge: Research coopetition on real-world urban computing', *Proceedings of the 10th International Conference on Mobile and Ubiquitous Multimedia, MUM'11*, (December 2011), pp. 205–208. doi: 10.1145/2107596.2107622.

Olivier, P. and Wright, P. (2015) 'Digital civics: Taking a local turn', *Interactions*, 22(4), pp. 61–63. doi: 10.1145/2776885.

Oosterlaken, I. (2009) 'Design for development: A capability approach', *Design Issues*, 25(4), pp. 91–102. doi: 10.1162/desi.2009.25.4.91.

Patel, N. *et al.* (2010) 'Avaaj Otalo - A field study of an interactive voice forum for small farmers in rural India', *Conference on Human Factors in Computing Systems - Proceedings*, 2(January), pp. 733–742. doi: 10.1145/1753326.1753434.

Peltonen, P. *et al.* (2007) 'Extending large-scale event participation with user-created mobile media on a public display', *Proceedings - MUM 2007: 6th International Conference on Mobile and Ubiquitous Multimedia*, 284, pp. 131–138. doi: 10.1145/1329469.1329487.

Peltonen, P. *et al.* (2008) '"It's Mine, Don't Touch!": Interactions at a Large Multi-Touch Display in a City Centre', p. 1285. doi: 10.1145/1357054.1357255.

Pipek, V. and Wulf, V. (2009) 'Journal of the Association for Information Systems Infrastructuring : Toward an Integrated Perspective on the Design and Use of Information Technology * Infrastructuring : Toward an Integrated Perspective on the Design and Use of Information Technology', *Journal of the Association for Information Systems*, 10(5), pp. 447–473. Available at: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.163.9558&rep=rep1&type=pdf.

Poderi, G. (2019) 'Sustaining platforms as commons: perspectives on participation,

infrastructure, and governance'. Taylor & Francis, pp. 243–255. doi: 10.1080/15710882.2019.1631351.

Poverty.org.uk (no date) *Numbers in low income*. Available at: http://www.poverty.org.uk/numbers-in-low-income/ (Accessed: 13 January 2021).

Pritchard, G. *et al.* (2014) 'Digitally driven', pp. 3617–3626. doi: 10.1145/2556288.2557156.

Prost, S. *et al.* (2019) 'Infrastructuring food democracy: The formation of a local food hub in the context of socio-economic deprivation', *Proceedings of the ACM on Human-Computer Interaction*, 3(CSCW). doi: 10.1145/3359159.

Public Health England (2014) *Rothbury Report 2015*. Available at: www.localhealth.org.uk (Accessed: 2 January 2021).

Rainey, J. *et al.* (2020) 'TalkFutures: Supporting qualitative practices in distributed community engagements', *DIS 2020 - Proceedings of the 2020 ACM Designing Interactive Systems Conference*, pp. 771–784. doi: 10.1145/3357236.3395531.

RDP Economist Team (2014) 'Impact Assessment: Rural Development Programme, 2014-2020', pp. 2014–2020.

RDP Economist Team (2020) 'RDPE Growth Programme: Rural Tourism', (February).

Reason, P. and Bradury, H. (2001) 'The Handbook of Action Research: Participative Inquiry and Practice', *Handbook of qualitative research methods in psychology*, p. 468.

Redhead, F. and Brereton, M. (2006) 'A qualitative analysis of local community communications', *ACM International Conference Proceeding Series*, 206, pp. 361–364. doi: 10.1145/1228175.1228245.

Redhead, F. and Brereton, M. (2009) 'Designing interaction for local communications: An urban screen study', *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 5727 LNCS(PART 2), pp. 457–460. doi: 10.1007/978-3-642-03658-3_49.

Richardson, D. *et al.* (2018) 'ParkLearn: Creating, sharing and engaging with place-based activities for seamless mobile learning', *MobileHCI 2018 - Beyond Mobile: The Next 20 Years - 20th International Conference on Human-Computer Interaction with Mobile Devices and Services, Conference Proceedings*, pp. 1–12. doi: 10.1145/3229434.3229462.

Roberson, J. and Nardi, B. (2010) 'Survival needs and social inclusion', p. 445. doi: 10.1145/1718918.1718993.

Robeyns, I. (2005) 'The Capability Approach: a theoretical survey', *Journal of Human Development*, 6(1), pp. 93–117. doi: 10.1080/146498805200034266.

Salim, A. and Wangusi, N. (2014) 'Mobile phone technology: An effective tool to fight

corruption in Kenya', *ACM International Conference Proceeding Series*, (September), pp. 300–305. doi: 10.1145/2612733.2612772.

Sayrs, L. (1998) 'InterViews: An Introduction to Qualitative Research Interviewing Steinar Kvale. Thousand Oaks, CA: Sage, 1996. 326 pp.', *The American Journal of Evaluation*, 19(2), pp. 267–270. doi: 10.1016/s1098-2140(99)80208-2.

Sen, A. (2005) 'Human Rights and Capabilities', *Journal of Human Development*, 6(2), pp. 151–166. doi: 10.1080/14649880500120491.

Simpson, J. A. (2015) 'Foundations of interpersonal trust', (May).

Sindall, K. and Sturgis, P. (2013) 'Austerity policing: Is visibility more important than absolute numbers in determining public confidence in the police?', *European Journal of Criminology*, 10(2), pp. 137–153. doi: 10.1177/1477370812461237.

Smith, T. *et al.* (2015) *The English Indices of Deprivation 2015 - Technical Report. Department for Communities and Local Government. London, UK.* Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/464485/Englis h_Indices_of_Deprivation_2015_-_Technical-Report.pdf.

Smyth, T. N. *et al.* (2010) 'Where there's a will there's a way: Mobile media sharing in urban india', *Conference on Human Factors in Computing Systems - Proceedings*, 2(December), pp. 753–762. doi: 10.1145/1753326.1753436.

Soro, A. *et al.* (2015) 'A noticeboard in "both worlds" unsurprising interfaces supporting easy bi-cultural content publication', *Conference on Human Factors in Computing Systems - Proceedings*, 18, pp. 2181–2186. doi: 10.1145/2702613.2732713.

Star, S. L. (1999) 'The ethnography of infrastructure', *American Behavioral Scientist*, (3), pp. 377–391. doi: 10.1177/00027649921955326.

Star, S. L. and Ruhleder, K. (1994) 'Steps Toward an Ecology of Infrastructure: Design and Access for Large Information Spaces', *Information Systems Research*, 7(1), pp. 111–134. doi: 10.1287/isre.7.1.111.

Stolterman, E. (2008) 'The nature of design practice and implications for interaction design research', *International Journal of Design*, 2(1), pp. 55–65.

Storz, O. *et al.* (2006) 'Public ubiquitous computing systems: Lessons from the e-Campus display deployments', *IEEE Pervasive Computing*, 5(3), pp. 40–47. doi: 10.1109/MPRV.2006.56.

Talhouk, R. *et al.* (2016) 'Syrian refugees and digital health in Lebanon: Opportunities for improving antenatal health', *Conference on Human Factors in Computing Systems - Proceedings*, pp. 331–342. doi: 10.1145/2858036.2858331.

Taylor, N. (2011) 'Supporting Village Community through Connected Situated Displays', *Methodology*, (January). Available at: http://www.nick-taylor.co.uk/wp-content/uploads/2011/08/nick-taylor-thesis.pdf.

Taylor, N. *et al.* (2012) 'Viewpoint: empowering communities with situated voting devices', *... in Computing Systems*, pp. 1361–1370. doi: 10.1145/2207676.2208594.

Taylor, N. *et al.* (2013) 'Leaving the Wild: Lessons from Community Technology Handovers', *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, pp. 1549–1558. doi: 10.1145/2470654.2466206.

Taylor, N. and Cheverst, K. (2009) 'Social interaction around a rural community photo display', *International Journal of Human Computer Studies*, 67(12), pp. 1037–1047. doi: 10.1016/j.ijhcs.2009.07.006.

Taylor, N. and Cheverst, K. (2010a) 'Creating a rural community display with local engagement', *DIS 2010 - Proceedings of the 8th ACM Conference on Designing Interactive Systems*, pp. 218–227. doi: 10.1145/1858171.1858209.

Taylor, N. and Cheverst, K. (2010b) 'Creating a rural community display with local engagement', *Proceedings of the 8th ACM Conference on Designing Interactive Systems - DIS '10*, p. 218. doi: 10.1145/1858171.1858209.

Tayoma, K. (2010) 'Can Technology End Poverty?', *Boston Review*, 2010(December 2010), pp. 1–5.

Townsend, P. (1982) 'Poverty in the United Kingdom: A Survey of Household Resources and Standards of Living. Peter Townsend', *American Journal of Sociology*, 88(2), pp. 452–454. doi: 10.1086/227691.

Townsend, P. and Bosanquet, N. (eds) (1972) *Labour and Inequality: Sixteen Fabian Essays*. First Edit. The Fabian Society.

Toyama, K. (2011) 'Technology as amplifier in international development', *ACM International Conference Proceeding Series*, pp. 75–82. doi: 10.1145/1940761.1940772.

Trischler, J., Dietrich, T. and Rundle-Thiele, S. (2019) 'Co-design: from expert- to user-driven ideas in public service design', *Public Management Review*, 21(11), pp. 1595–1619. doi: 10.1080/14719037.2019.1619810.

Trust for London (2020) *Crime and Income Deprivation: London 2018-2019*. Available at: https://www.trustforlondon.org.uk/data/crime-and-income-deprivation/ (Accessed: 15 January 2021).

Tuffin, R., Morris, J. and Poole, A. (2006) 'An evaluation of the Impact of the Ntional Reassurance Policing Programme, HOme Office Research study 296, London', *Policing: An*

International Journal of Police Strategies & Management, 1(January), pp. 149–160. Available at: http://policing.oxfordjournals.org/cgi/doi/10.1093/police/pam024.

UK Research and Innovation (2016) *Urban Living Partnership - Newcastle and Gateshead City Region*. Available at: https://gtr.ukri.org/projects?ref=EP%2FP00203X%2F1 (Accessed: 20 February 2021).

Upper Coquetdale Churches Together (no date). Available at: https://armstronghall.org.uk/ucct/ (Accessed: 2 January 2021).

Vlachokyriakos, V. *et al.* (2014) 'PosterVote: Expanding the action repertoire for local political activism', *Proceedings of the Conference on Designing Interactive Systems: Processes, Practices, Methods, and Techniques, DIS*, pp. 795–804. doi: 10.1145/2598510.2598523.

Vlachokyriakos, V. *et al.* (2018) 'Infrastructuring the Solidarity Economy : Unpacking Strategies and Tactics in Designing Social Innovation', *In Proc. of CHI*, pp. 1–12. doi: 10.1145/3173574.3174055.

Weiser, M. *et al.* (1999) 'The origins of ubiquitous computing research at PARC', *IBM Systems Journal*, 38(4), pp. 693–696. doi: 10.1147/sj.384.0693.

Wikipedia (2021) *Northumbria Police*. Available at: https://en.wikipedia.org/wiki/Northumbria_Police.

11) Appendix

11.1) Conet Policies and Guidelines

Digital Displays for Coquetdale - DRAFT

Aims

- To provide up-to-date information for the community on events and opportunities
- To provide this information as visibly and widely as practical

Objectives

- To give leads on youth opportunities or jobs
- To publicise up-coming events
- To publicise short-notice changes in event details (venues, schedules etc)
- To provide timely information during major events
- To locate information screens in public areas
- To duplicate all the information on a web site
- To provide updates for information published in "Over The Bridges"
- To allow those hosting a screen to add information to their own screen

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Administration

- The system will be called CoNet: reflecting "Coquetdale Network - Community Network"
- CoNet will operate within the Upper Coquetdale News Group, part of UCCT
- Policy will be set by UCNG
- CoNet will have an Editor and an Administrator (which may be the same person)
- Email contact is via editor@conet.uk and admin@conet.uk
- The Editor is responsible for content and day-to-day running of the system
- The Administrator is responsible for negotiating screen locations and installations
- Screen locations will be hosted by members of the community (businesses, organisations etc)
- Locations with a screen are referred to as "hosts"
- There will also be sub-editors (for the whole system) and host-editors (for individual Host sites)
- First-line editorial responsibility will be with the Editor
- All references to "screen" refer to the screen, its mount, the computer and any power supply

Hardware

- The first screens will be provided free of charge at the discretion of the Group
- Priority will be given to non-profit locations
- Subsequent screens may be charged at cost, or subsidised by the Group at its discretion
- Hosts may also install self-funded screens (with assistance if required) – CoNet operation is free
- Requests for a screen should be made to the Administrator
- Physical installation will be the responsibility of the Host or the Group by agreement
- Installation in all cases will be consistent with relevant building, planning & electrical regulations
- For screens installed by CoNet, insurance will be covered by UCNG 3rd party cover <CORRECT??>
- Except for self-funded screens, all screens remain property of the Group
- Screens will be considered "portable appliances" for electrical safety (whether fixed or not)
- Initial safety testing (PAT) will be by a competent person and a test certificate issued to the Host
- Screens will be tested at agreed intervals - depending on installation, by the Host or the Group

Host responsibilities

- Where available, Hosts will provide internet access via Wi-Fi or ethernet (data bandwidth is tiny)
- For Wi-Fi, Hosts will need to provide the password to allow the screens to communicate with the internet
- This password will be kept confidential
- Static screen will operate if internet access is not available
- Static screens will require manual updating. A manual update procedure will be agreed with hosts.
- Hosts determine when screens will be turned on, but this should be whenever area is open to the public
- Where practical, Hosts should let the Editor know the schedule
- Hosts should let the Administrator or Editor know if their screen is out of service for any reason
- Hosts will be responsible for electricity costs (typically about £1 a week)
- Hosts wishing to move screens may do so at their own expense, but should advise the Administrator
- Hosts should ensure that screens will covered by their own (contents) insurance
- Hosts will take responsibility for occasional visual checking for electrical and mechanical safety
- Technical problems with screens should be reported to the Administrator at earliest opportunity
- Any screen raising concerns may be taken out of service until the issue can be resolved
- Abuse of a screen will be referred to the UCNG and may result in the screen being removed or disabled

Content

- Content is a series of static slides, which can contain mixture of text and images.
- Text size will be chosen for maximum legibility and will therefore reduce the available word count.
- If additional information is required, this can be added to the CoNet web site
- Slides will display in a loop, called a "carousel".
- The maximum duration of the carousel will be determined by the Editor.
- Primary contact for slide requests is via email or in writing to the Editor, or via the UCNG.
- Telephone or in-person requests will not be accepted, except in exceptional circumstances.
- Host content is limited to 1 slide in 4, and a maximum of 6 slides per carousel < **to be discussed>.**
- Host content is only displayed on a Host's screen.
- The Group will, at its discretion, decide on a limited "must carry" information list.
- Only one slide per event/organisation – exceptions would be major town events (Music Festival etc).
- For major events, screens may be temporarily dedicated to that event.
- Slide layout/format is at the discretion of the Editor and within the constraints of the system.
- Events/organisations may request a specific layout/format, but these cannot be guaranteed.
- In the event of a dispute, UCNG will have the final say.
- Organisations requesting slides must provide reliable contact details in case of queries.
- Specific event information must be accurate – Editor should be informed of any changes.
- Last-minute changes to event details can be flagged on screens, even if the event hasn't been featured.
- Any last-minute changes **must** come from a verifiable source.
- Slide requests must come with suitable text – up to 120 words (fewer if picture/logo is included).
- If a significant query arises and an organiser cannot be contacted, slide will be suspended temporarily.
- No payment will be accepted for pages from voluntary/charity groups.
- System-wide paid-for commercial advertising may be considered, subject to separate advertising policy.
- Financial contribution will be held in a separate fund to assist running costs, maintenance and testing.
- Urgent community information may be displayed at the Editor's discretion as a "flash" on screen.
- Anyone making such a request must inform the Editor as soon possible after the situation is resolved.
- Any failure to advise the Editor may result in withdrawal of the "flash" facility.
- It is vital that any such "flash" is timely and accurate to avoid discrediting the system.
- All slides must be approved by the Editor before publication (except for host-provided slides).
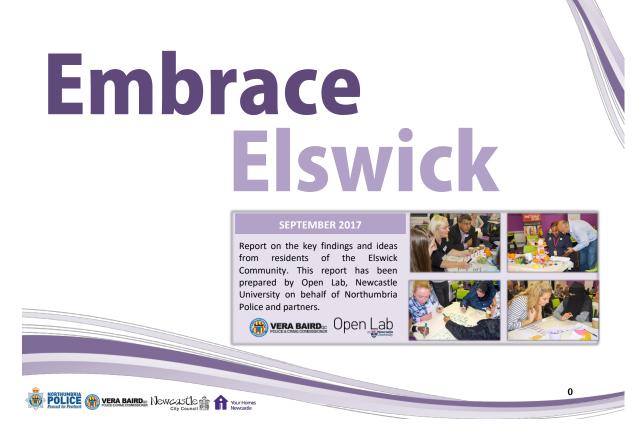
Editorial principles

- Slides may be prioritised, and there are no guarantees that a request for a slide can be met.
- Political and opinion content is strictly forbidden on all screens, including Host screens.
- There may be exceptions for simple announcements of meetings and election reminders.
- Absolutely no profanity, vulgarity etc.
- Slides should not contain any flashing imagery, or imagery that could be considered highly distracting.
- Any slide raising concern will be disabled until the issue can be resolved.
- Slides should not normally remain on screen for less than 10 seconds.
- Slides should remain visible long enough to be read (at 2 words/sec).
- Slides should be concise and not contain irrelevant information.
- Each slide must be self-contained, although a pointer to additional information would be allowed.
- "Scrolling text" will be avoided where possible – content should fit on a screen without it.
- Carousel length should be limited to 5 minutes **<details to be discussed>**
- There should be means to see how far through the sequence.
- All content will also be available online at conet.uk, and a URL will be clearly visible at all times.

Advertising

- Paid-for advertisements in Over The Bridges will also appear on conet.uk
- The Group may also allow limited paid-for advertising on the screens.
- Paid-for advertising must not dominate the system, and should be clearly identifiable as such.
- On-screen paid-for advertising will only be available for businesses serving the local community.
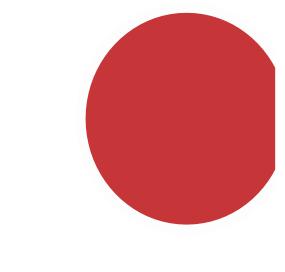
2nd June 2017

279

11.2) Embrace Elswick World Café Report
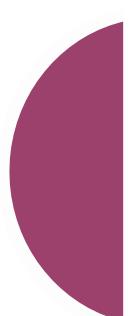

Full report available via:

https://drive.google.com/file/d/1t_QMCbOdLi_hwBgWlotZDbk2jyonYHap/view?usp=sharing

11.3) Brighter Byker World Café Report

Discovery Phase

Full report available via:

11.4) Meadow Well: World Café Report

Full report available via:

https://drive.google.com/file/d/1YOmLTRUSRVDZcATTwsEvBZ6BZOcfNOZV/view?usp=sharing

11.5) Beacon Lough East: World Café Report

Full report available via:

https://drive.google.com/file/d/1drcmO47qXrvqEyBdXxmftXgUEdVXzQ5N/view?usp=sharing

11.6) Bensham: World Café Report

Best of
Bensham

May 2018

Report on the key findings and ideas from residents of the Bensham Community. This report has been prepared by Northumbria Police in partnership with Newcastle University on behalf of partners.

Full report available via:

https://drive.google.com/file/d/1FrOWtn-F-Ezsx6Tfw0PN24MV8sELXBn9/view?usp=sharing

11.7) Chopwell: World Café Report

Chopwell World Café

Round One: What would help the village and make you feel safe:

This round focused on what the people of Chopwell wanted to make them feel safe. 167 comments were received of which 48 unique codes were generated which resulted in 6 distinct themes.

The 6 main themes that emerged from the comments related to Council, Police and Community Issues followed by Landlord, environment and drug related issues.

It's clear from the number of comments left that one of the biggest complaints is that private landlords are not vetting their tenants and are allowing anybody to rent their properties. The residents feel that the private landlords and the council should be working together with regards to this and challenging the landlords where appropriate.

Many residents commented on the fact that they would like more of a visible presence of Police resources in the village and preferably on foot along with a higher level of CCTV.

The other main issue relates to the Community themselves and the underlying feeling is that the vast majority of residents want to make the village a safer place to live and they are wanting to engage with the authorities in reporting crime and environmental issues.

Round Two: As a good neighbour, what can you do to help make Chopwell feel like a safer place to live and visit?

Round two focussed on how the Chopwell residents could help. From the 71 comments received 29 unique codes where generated resulting in 6 main themes.

These themes were as follows in descending order of Community Issues, Neighbourhood, Lack of communication, charities and community groups, Police and the Council.

The top two most popular themes were 'Community Issues' and 'Neighbourhood' which proves that the residents want to make Chopwell a safer place to live and they are willing to help.

There also appears to be a lack of communication across the community in regards to each other and with regards to the contacting the Police and the Council. There is a loss of faith with regards to the '101' system and many residents would like to be able to contact the local station directly. Likewise there appears to be an issue with regards to contacting the council.

Round Three: How can we work with and support you to help make Chopwell feel like a safer place to live and visit?

Full report available via:

https://drive.google.com/file/d/1YY0uaAcIKzfKG3BVr4vCDIKZfZjSDRTF/view?usp=sharing

11.8) Birtley: World Café Report

Birtley World Café

Birtley Community Partnership working closely with Gateshead Council and Northumbria Police invited residents from across Birtley to attend a World Café event at Birtley Community Centre on Thursday 27th September 2018 6pm – 8pm.

The World Café event aimed to generate conversations, promote discussion and help to generate ideas and solutions to challenging issues within Birtley. Trained facilitators encouraged people to chat in small groups about issues which were important to them.

The residents attending on the night were asked three questions which can be introduced as 'starter, main course and dessert' - residents sitting together at café-style tables with food and refreshments being served.

Forty-eight residents attended – Twenty-eight females and twenty males of which thirty were white-British and 1eighteen were Arabic. Forty-seven respondents stated that they were happy with how the consultation event went and only one remained neither satisfied not dissatisfied.

Question One: What is good about Birtley?

Question one focused on what the people of Birtley thought was good about their town. 161 comments were received which generated 7 distinct themes.

These themes were Council, Police, Community/Volunteering, Environment, Place, Infrastructure/ Transport and TGHC/ Housing.

It's clear, from the sheer number of comments made, that residents feel that Birtley is a great place to live - with a diverse population and a great local community image. Access and links via public transport and road networks to key shopping areas such as the Metro Centre and Newcastle also rate highly with residents. Gateshead Council was also congratulated on the work it delivered around schools, parks and public facilities.

Question Two: What could be better in Birtley?

Question two focused on what Birtley residents felt could be better in Birtley. 237 comments received also generated the same 7 distinct themes.
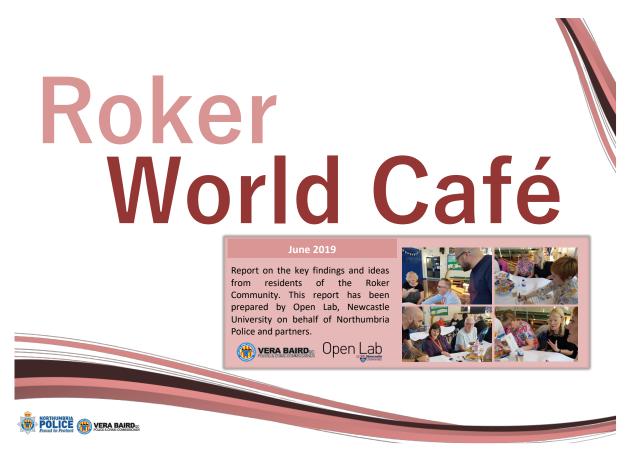
The top three most commented upon themes were Gateshead Council issues, police issues and issues around 'place'.

Although the use of social media by community groups and residents is extremely widespread, there also appears to be a lack of cohesion / communication across parts of the community about each other and services / activities being delivered within the area. There is a perception of a loss of faith regarding Northumbria Police's '101' system and many residents would like to be able to contact neighbourhood officers more directly. Likewise, there appears to be an issue with regards to contacting the Council and Ward Councillors as well as a lack of awareness of levels of service delivery across Council services.

Full report available via:

https://drive.google.com/file/d/1ZT4sumkxGCBrFwP5rTvqsOyY03BA9mtt/view?usp=sharing

11.9) Roker: World Café Report

Roker
World Café

Full report available via:

https://drive.google.com/file/d/1bwNcQLPGm-shBvj82wXiaffKxsC7goJD/view?usp=sharing