

Creating community connections: Analysing the role of Superfast Broadband in enhancing rural community resilience

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Abstract

Rural communities are highly susceptible to socio-economic and environmental shifts due to factors such as single-industry economies, limited public service provision, and physical distance to governance institutions. In a global society constantly in flux, this begs the question of what can be done to encourage rural community resilience, their ability to adapt and thrive into the future. Some studies have examined enhancing local institutions and boosting economic linkages, however, this represents a small area of research. In an increasingly digitally focused society, it is important to analyse the potential for superfast broadband to enhance rural community resilience.

Superfast broadband services (Internet connections with speeds of at least thirty megabits per second) are becoming a constant presence in marketing and government literature, which often detail beneficial impacts on individuals' social activities, employment options, and overall community well being. This paper will present findings from a multi-phase project examining community-led superfast broadband initiatives in the United Kingdom. The project includes analysis of communities *prior* to obtaining superfast services as well as *following* a period of connectivity, drawing lessons for international contexts. The framework for assessing effects of superfast broadband on rural community resilience will be outlined with early indications from the study given, postulating several transformative facets of digital connectivity for rural communities.

Introduction

This paper presents initial results from a PhD study, seeking to clarify the manner in which rural community resilience is impacted by the inclusion of superfast broadband services. Through in-depth, qualitative case study analysis in two locations in the United Kingdom, it aims to identify how individuals and communities develop, use and interact with superfast broadband technology and its relationship with resilience. This paper will first discuss the use of resilience as a theoretical construct, followed by an overview of current normative discourses of the Internet. I will then briefly present methods used, followed by initial results from the first phase of the project. Finally, I will reflect on the transformative facets of superfast broadband connectivity and future work.

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Resilience: A theoretical framework

There is a vast array of literature discussing and debating resilience. Ecologically, resilience refers to the development of ecosystems and their ability to absorb changes and maintain structure in times of disturbance (Holling, 1973). Social resilience builds upon this to represent the ability of a community to withstand shocks due to external factors (Adger, 2000). This notion of resilience is concerned with adapting to stresses to maintain acceptable levels of function and identity. Resilience has therefore been historically constructed as a reactionary process to external shocks.

However, this definition is constantly in flux and highly dependent on the discipline, authorship and audience. The complexity of the term, coupled with a wide range of uses, poses challenges to researchers attempting to use it as a framework or tool for community-based research. In more recent literature, community resilience can be understood to have a much broader scope, incorporating both empowerment and development processes (Skerratt and Steiner, 2013). Norris et al. (2008) define it as both a reactionary and proactive process: “A process linking a set of adaptive capacities to a positive trajectory of function and adaptation after a disturbance” (p. 131). This demonstrates a shift in resilience thinking, and an introduction to the proactive nature of social resilience.

As Folke (2006) discusses, it is evident that resilience of complex adaptive systems, like communities, is not simply about resisting change or conserving existing structures. Rather, it is about the “opportunities that disturbance opens up in terms of recombination of evolved structures and processes, renewal of the system and emergence of new trajectories” (Folke, 2006, p. 259). It allows for adaptive capacity building and generates a dynamic relationship between sustaining and developing with change. Communities with limited or static capacities conversely, run the risk of slowed recovery and prolonged dysfunction (Sherrieb et al., 2010). Resilience is then being constructed as being a part of the evolving nature of evaluating community growth and transformation.

Magis (2010) further contextualises community resilience, defining it as “...the existence, development, and engagement of community resources by community members in order to thrive in an environment characterised by change, uncertainty, unpredictability, and surprise. Members of resilient communities intentionally develop personal and collective capacity that they engage to respond to and influence change, to sustain and renew the community, and to develop new trajectories for the communities' future” (Magis, 2010). This demonstrates both a reactionary aspect as well as a proactive process of developing community capacities. Given its encompassing scope, this is considered to be the most effective and relevant definition of resilience for this research.

Rural Community Resilience and Technology

The impact of broadband services, particularly in rural areas, is a key area of research. Rural economy and society are commonly held to be enhanced by the inclusion of Internet, particularly its latest incarnation, superfast broadband (2010, DCMS). In the resilience context, it is then important to understand individual and community use of the Internet to determine in real terms how and if superfast broadband builds adaptive capacities to support future community recovery and transformation.

The actual impact of a community's use of Internet, or their ability to develop resilience capacities, is ultimately derived from each individual's understanding and perception of Internet's importance and meaning within modern society. The following section will discuss these common perceptions of the Internet within society, and how those meanings can influence resilience capacity development.

Discourses of Internet

The Internet is conceptualized broadly across a range of literature as a good, a public utility, and a right. This section will address these three mainstream discourses of Internet technology. First, I will discuss the concept of Internet as a good, firmly placing our understanding in an economic context. Second, I will discuss it as a utility, an emerging discourse that equates its installation and operation to that of electricity and others. Finally I will discuss it as a human right.

In many ways, the Internet is often perceived in terms of economics, whereby it is a market good, freely available to be bought or sold on the market with a certain level of income: affordability being a key factor in Internet diffusion (Zhang, 2013). The deployment practices of Internet networks, particularly in the European Union, mirror this thinking and are primarily governed by market forces, whereby the Internet is deployed through a market-led mentality, targeting regions, or communities that provide measurable profits to the telecommunications industry (Briglauer and Gugler, 2013 in press; Skerratt, 2010). This entails a certain amount of complacency in continuously developing urban networks, where high density begets profits for Internet providers, prior to rural, sparse regions.

Looking to the debate about the impact of Internet and its influence on society, we again see economic indicators featured prominently, such as Gross National Product (GNP) or Gross Domestic Product (GDP) and employment growth, which strengthens and proliferates the view of the Internet as a market entity (Kolko, 2012; Thomson, Jr. and Garbacz, 2011).

Despite this construct of the Internet as a market good, there is also recognition by governmental organisations that rural regions, or sparse regions, will thus not be provided for under a free market mentality, and therefore public subsidies are often dispersed to encourage equitable telecommunication development, similar in the past to electricity and other public utility development (Mandel, et al., 2011; Cave and Martin, 2010). This often leads to the Internet being portrayed as a utility in itself. It fulfills common characteristics of a utility including necessity, reliability, usability, utilization, scalable, and service exclusivity (Rappa, 2004). The expectation of Internet availability is also not unlike the dependence on affordable and readily available electricity, heat, or water (Crawford, 2013; Rappa, 2004). In terms of operation, its dispersal is also often modelled in the same manner as a conventional public utility business: using either a metering process or a subscription model (Rappa, 2004).

As these interventions are used to equitably provide for the population, the discourse of Internet has continued to evolve beyond a utility and into a right (Townsend, et al., 2013; Skerratt et al., 2012). The Internet as an entity is quickly becoming entrenched in people's societal and economic interactions, and as such, the concept of accessing the Internet as a right is gaining momentum. Finland has declared Internet a citizen's

subjective right, creating a legal requirement of 1 megabit per second and stating that similar to water or electricity, the Internet is something you cannot live without (Townsend, et al., 2013; Skerratt, et al., 2012).

Additionally, we also see a strand of this rights-based debate centering on the potential for Internet to be a tool to allow people to exercise their rights, be they human or civil (Cerf, 2012). Barry (2013) states that access is increasingly instrumental to the provision of economic rights, such as the right to work. This understanding of Internet, I argue, results in it being seen as an enabler of rights, and thus increasingly important in modern society.

The lens with which the Internet is conceptualized by individuals and communities has a profound influence on its understood impacts on that community's resilience. In relation to resilience capacity development, how individuals use and engage with Internet technology will change how influential it can be and in what sectors (economic, civic, and so on) of the community. It also has an influence on how involved individuals and communities may become in order to gain access to the Internet, and in this case, to superfast Internet. This shift towards conceptualizing Internet as a utility or enabler of rights is reflected in the creation of rural community-led organisations to develop and operate superfast broadband networks amidst the sea of market-led telecommunications companies. This provides the focus for this PhD study, outlined in the following sections.

Methods

This study aims to better understand resilience capacity development in the context of both superfast Internet deployment and its use. The study considers two rural community-led superfast broadband initiatives in the UK: Broadband for the Rural North (B4RN) and Broadband for Glencaple and Lowther (B4GAL), both of which embody a not-for-profit business model whilst developing and installing their own superfast, fibre-optic cable, Internet networks. The project is conducting two phases of interviews using a longitudinal approach to answer the following questions:

- How can concepts of resilience be related to digital infrastructure development and use?
- Does the process of acquiring technology play a role in enhancing rural community resilience?
- Does the presence of superfast broadband technology infrastructure play a role in enhancing rural community resilience?

These two phases of interviews will cover the time period prior to and post-internet connectivity. The pre- and post-connectivity phases target two perspectives; the user perspective and the governance or organizational perspective. Within the user perspective, we also allow for business and personal use discussion as well as various adopter types (from keen early adopters to non-adopters of the technology).

The interview data was thematically coded, utilising four pre-determined themes for initial analysis and followed an informed grounded approach to identify any sub-themes in the data. The results presented here depict findings from the broad themes and emergent sub-themes with links to resilience in the pre-connectivity phase. 36

interviews were conducted in the pre-connectivity phase. In the B4RN case study we interviewed 25 individuals (18 users, 6 governance individuals, and 1 policymaker) and in the B4GAL case study we interviewed 11 individuals (8 users and 3 governance individuals). As this is a smaller region, a smaller sample is relatively proportional.

This research has enabled the development of an analytical framework for assessing resilience within community-based organisations. It depicts the cycle of resilience development through community-led initiative set-up and incentivisation, community and external engagement, diffusion of outcomes and thematic impacts. Qualitative research, conducted across the phases of organisation and technology development with key stakeholders, as well as technology users, provides the most robust understanding of resilience development in this context. This framework of resilience identification within community-based initiatives will continue to be developed throughout the remainder of the study (Heesen, 2013; Heesen, Farrington, and Skerratt, 2013).

Initial Results: Pre-connectivity Analysis

Technology Engagement

Several strands of enquiry were undertaken to investigate the influence of Internet on employment, personal life, and trust and knowledge of technology. With respect to current use, rural users were plagued with slow speeds, unreliable connection and an inability to have multiple users online. Future use of superfast broadband was

“I sometimes feel we’re excluded from certain aspects of what you might call modern life because things come on iPlayer...lots of things, they put ‘want to know more, go to our website’. You sort of feel a bit excluded from things that a lot of people take for granted” (B4RN Participant 14, 2012).

embedded in being more efficient online, rather than in accessing untried web-based technologies. When discussing accessing services online, participants often highlighted things they may do more of, or access more readily with a faster reliable connection (i.e. banking, blogging, and media services), but rarely new, untried or untested Internet services. This identifies with an aspect of the community resilience concept that is concerned with acting strategically and developing individual resources through online activities. Individual-scale resource development is thus understood to be present through Internet use. Additional steps, however, need to be taken to ascertain whether individual capacities developed through these actions contribute to community-level resilience at some stage.

Rural Life

Living rurally was a key discussion theme and several facets of the interviews are relevant here. It was highlighted through the pre-connectivity data that remaining in this loop of inadequate provision in comparison to the growth of urban centres is unacceptable and will quickly lead to the deterioration of rural society. An interesting concept also emerged identifying the Internet as primarily desired for connecting to wider, global economy and society, not for connections in the rural

“...you do need that technological bridge. You know you need to be able to communicate efficiently and effectively with everybody else.” (B4GAL Participant 1, 2013).

villages themselves. This allows us to query what resilience can be attributed to superfast Internet at the community scale and the individual scale.

Rural Work.

For employment and economic endeavours in rural areas, the Internet was exceedingly important, but in different ways. "...In our case, reliability is a thousand times more important than speed...we get penalties if we don't fulfil our orders..." (B4RN Participant 3, 2012). When discussing profits, one participant stated: "No, I don't think it impacted profits, I think...hmm...it's not impacted profits, but it has

"Yesterday there was 350 megabytes of video for a client that will take hours to upload...I'm getting something like 4 Megabits of download, but 5 to 10 percent of that speed as upload..."
(B4RN Participant 18, 2012).

possibly impacted the effectiveness of electronic marketing" (B4RN Participant 1, 2012). Another stated: "I don't think it affects turnover, but I think there are things we could do, like access to information and resources that we don't do because it is such hard work "(B4RN

Participant 14, 2012). Another stated: "we're pulling people from further away, you know Edinburgh, Glasgow, London, and they find the website and then taking a trip out and coming to see what we have... I would say, sort of 50% of our sales are done from the Internet, so it's very important (B4GAL Participant 1, 2013). It is clear that obtaining superfast broadband was seen as a benefit to local entrepreneurs and businesses, however it was not uniformly the speed people craved; rather it was the reliability the connection affords, and the ability to use the Internet as a tool for furthering the business in terms of communication outside the region, and finally the knock on effects that may have for profits.

Community Well-being

Most participants were satisfied with their communities' strength and social well-being, and felt involved and responsible for the future economic sustainability of the village. It was identified that when an occasion or crisis arose, the community would band together, creating issue-based action. The formation of a broadband-specific group was linked with that process: the 'issue' being reflected in the perceived dominance of Internet connectivity in economic and societal processes. This is

"The thing that galvanised people [at B4GAL] was the footbridge [a historic landmark in need of repair]...and it was so funny because everyone was there to do with the footbridge, but as soon as we started to say Internet, everyone started going, 'and I can't get this and I can't get this...' Everyone has their own personal need for it, and I think that was a great thing. And that was the community thing about it as well, because there was a whole range of needs coming through. And so to me that was a big part of it." (B4GAL Participant 10, 2013).

linked closely with the dominant discourse of social resilience, whereby resilience is the capacity for a community to reorganise following a change (increasing demand for Internet use) and retain similar function and identity. This however does not include the creation of proactive capacities as identified by Magis (2010).

Community-led Broadband Organisation

The development of community-led broadband initiatives created a community of interest, whereby the broadband issue united people across disparate villages and countryside locations. "When I first moved here I didn't realise how poorly connected it would be in terms of Internet access and things like that so it was a bit of a surprise.

“Don’t see why our community should be left behind, if there’s people willing to do the work” (B4RN Participant 2, 2012).

Luckily, I moved into an area where there was a few active people and where people had begin to work together and develop a network so I just joined the network...” (B4RN Participant 5, 2012). The localised,

village-level, community of place was still evident and a sense of pride in community contributed to involvement levels. Many participants highlighted their involvement as stemming from an interest in community in general: “...even if it was a bit more expensive than BT or whatever, or the alternatives, I would just sign up with them [B4GAL] to support them” (B4GAL Participant 6, 2013).

There was an added level of confidence in the Internet network since those building it were in geographic proximity to the user. This relates to the ability to access community resources as more confidence in them can increase their proliferation, engagement and potential development (Lawson and Kearns, 2010). “I think that if we can get the B4RN project up and running, we can improve some of the services then I think there’s potential to grow the community a little bit...” (B4RN Participant 5, 2012).

Conclusions and Future Work

It is clear that the inclusion of superfast broadband technology is perceptibly influential to individual and community resilience in different ways. Technology is embedded in how people live and work and access to high speeds can better enable communication with modern society outside the auspices of the geographically bound community. Community satisfaction was high in rural areas, however, it was recognised that the importance of Internet connectivity was causing a rethink of that satisfaction. The structural element of community-based broadband development increased confidence in network development and was a source of personal and collective involvement.

“We love the cottage, it’s nice to have the garden and the views. But we don’t see why we should therefore have to make do without good access to electronic services” (B4RN Participant 6, 2012).

This research identifies the links between telecommunications and community resilience. This ultimately provides support for policy guidance on digital infrastructure development. The broad study will provide key benefits to the following research areas: developing the research on resilience theory in a social context; and providing an understanding of the actual influence of digital connectivity on rural community resilience.

There are several key areas for future research. Firstly, this paper presents findings from the first phase of a multi-phase project. It is now crucial to conduct post-connectivity research to fully comprehend Internet connectivity and how that relates to the resilience of individuals and communities. Secondly, we cannot state in a quantitative way what resilience can be attributed to superfast broadband digital connectivity. This is a purely qualitative study and we have not aimed to be representational, but rather to capture a snapshot of attitudes towards superfast broadband pre-connection and in the future, post-connection. This limits the generality of the data, but it will still provide lessons about the deployment and usage patterns in rural communities, information that can be taken forward by industry and

policy organisations. Finally, a higher level analysis into methods of internet development is needed to note if any impacts felt from this process of community-led initiatives are transferable to other methods such as large scale commercial roll-out.

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