

Community Broadband Initiatives: What makes them successful and why?

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ABSTRACT

Although access to broadband has become a facility embedded in everyday life, many communities still have poor or no connectivity, especially in rural areas. The paper considers how some local communities have taken matters into their own hands and set up their own community broadband infrastructure in the UK. The paper examines four case study rural communities in terms of the organisation of broadband provision. It identifies common skills and resources that were necessary in order for these community broadband initiatives to be successful in the form of five capitals: human, technological, identity and financial.

Categories and Subject Descriptors

K.4.3 [Organisational Impacts]: Computer supported collaborative work

Author Keywords

community broadband; social enterprise; social capital; technology; communications technologies

1. INTRODUCTION

“There is a quiet revolution taking place in the provision of rural broadband. An increasing number of communities are building their own distribution networks. In the last three years, community projects have been responsible for over 1000 connections, and this number is likely to double next year. Much of this has taken place without government funding. Often the communities are so small that their success goes unnoticed.” Peter Buneman and Gordon Hughes 2013, <http://www.tegola.org.uk/papers/developing-rural-broadband.pdf>

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The UK government aims to extend ‘superfast’ broadband connections of at least 24 mbps to 95 per cent of premises by 2017 as part of its Broadband Delivery UK strategy (<https://www.gov.uk/broadband-delivery-uk>). However, this still leaves many communities with inadequate or no broadband connectivity and a problem with providing for the final 5 per cent in the future. This is especially the case in rural communities and sparsely populated areas such as those found in many parts of Scotland. The lack of technological infrastructure can inhibit the economic and social sustainability of those communities as they get left further and further behind in the ‘information economy’ [11, 13].

Some communities have taken the initiative in to their own hands by setting up their own broadband infrastructure. This paper looks at how this has been done using the example of four case studies in the UK over the last decade. We argue that whilst a number of different technologies can be deployed, ‘bottom up’ community broadband initiatives depend upon common factors such as human, social and technological capital, local commitment and the deployment of various financial and other resources which we term identity capital and financial capital. The diversity of these examples means that they are best analysed as case studies [10]. In the remainder of this paper we look at the villages in questions, how they introduced their community broadband initiatives and finally what success factors they had in common.

Information technology has become increasingly important for delivering services such as those from government (tax returns, agricultural subsidies, social security), education through e-learning initiatives for adults and children, health delivery services and opportunities for participation and democracy. Internet is also increasingly used for shopping, for entertainment and for social networking. Information technology provides businesses with vital access to markets and to other business resources as well as enabling people to work remotely [23, 24]. Furthermore, digital technologies can be a way of providing better social

cohesion within communities [13]. Information technology is now woven into the fabric of everyday life with the assumption of ever faster and expanding services.

However, not all communities have been able to take advantage of these improvements in communications. Some are cut off on account of social and economic problems, having deprived populations lacking in access to digital tools [18]. Others are geographically isolated, perhaps on islands, or with sparse populations where the costs of providing fast broadband services make it uneconomical for mainstream Internet providers to deliver services. This situation is often found in rural areas, and particularly in Scotland, where geographical features, such as mountains, lochs and islands, make it difficult to provide broadband infrastructure [19, 20]. Yet the delivery of services via ICT are even more important for isolated rural communities which might be otherwise cut off from mainstream developments [2]. As demand rises, these services require more and more bandwidth.

In other parts of the world, broadband has been provided through special government sponsorship of hard-to-reach communities and this has been especially the case in Canada and New Zealand, with similar geographical features to Scotland [5] These are examples mainly of 'top down' initiatives where the government has set up or piloted schemes to enable access of remote communities, such as First Nations in Canada [12]. What is less often documented are the examples of 'bottom up' initiatives whereby communities have mobilised resources to create their own fast broad band connectivity.

Some studies have considered the role of ICT in community development through community leadership and social capital [15, 16]. Drawing upon this tradition, this study focuses upon how communities set up initiatives to provide access to ICT and the role of community organisations in the mobilisation of these resources and actions. In other words, it considers the process of gaining access to fast broadband as a factor in community development. Elsewhere, Kenneth Pigg points out that community leadership differs from conventional organisational leadership in that it involves the mobilisation of network resources and requires wide engagement rather than top-down styles of leadership focused on individuals [14]. He sees community leadership as "an emergent property arising from specific kinds of relationships among community actors" [14:196]. Therefore the skills required to mobilise a community are different to those required for an organisation. These issues can be explored through case studies of how community broadband was set up using various models of leadership and organisation.

A variety of factors have been identified to understand how community broadband initiatives work. For example, in a Canadian context, Sylvia Albert identifies six factors in the 'smart' community development movement, which are: partnerships (several community players participating at the

table); applications (common vision in the development applications); infrastructure (ensuring the adequacy of the technology infrastructure); vision (common vision); economic development (the desire to co-build economic foundations); users (developing a culture of use, knowledge-based workforce, digital democracy) [1]. Although this was helpful as a framing for community broadband initiatives, we wanted to see how this could be applied in small rural communities in the UK. A different model is developed by Hughes [7] focusing more upon the technology and relationships between providers and customers. Hughes' model however, does not address the community relationships involved, which is the focus of this paper.

Pigg and Crank's [16] classification of five ways in which local communities provide ICT services focuses more on the relationship between community, business interests and the local government. Their first type is the *business-driven*, this is where a small group of local entrepreneurs banded together to bring the advanced ICT to their community. Though run as a business, it is of great value to the community. The second type *municipal utility initiated* is where a local community create their own utility. A group of actors establish an independent body to provide this service without the aid, but with the approval, of the local government. In the *entrepreneur-driven* model, an individual led a project as a result of their interest in creating a 'wired' housing development [16:69], then expanded the project to local businesses and educational institutions. Their fourth type is labelled as *community based* where the community set up a village committee to implement the technology. It was linked to the local government. The final type is the *diverse commercial system* where there was no centralised movement to improve the ICT provision; instead there were a combination of multiple commercial providers working alongside municipal provisions for public buildings.

Though these classifications are useful in understanding the social context of each project, we found some problems presented themselves when applying them to our case studies. First, Pigg and Crank's [16] work is based upon a very open definition of ICT, whilst most of our case studies were originally chosen due to being specifically about community broadband Internet provision. Secondly, whilst the classification works very well when looking at specific points in time, and at particular aspects of ICT facilities of each of the villages, we found that the organisational models were constantly shifting and changing as new technologies became available and government policies changed. The third difficulty is that the terminology used in the original paper does not translate well into a rural UK context. What we draw from Pigg and Crank however, is the understanding of the blending of municipal, private and non-profit organisations that provide the resources for community ICT development, which we explore in our case studies in the UK. However, we have also considered how

these resources were socially embedded and how they evolved in different contexts.

2. METHODS

The research was carried out between 2012 and 2014 using interviews with key informants in each of the identified locations.

The locations were selected because they had all developed their own community broadband initiatives. Although some may have had some connectivity previously, the community broadband initiative provided far faster and more comprehensive services to those communities, enabling them to keep up with developments elsewhere. Initial field work in each of the communities consisted both of expert interviews, and also of participant observation in daily life and in community events. Researchers identified key informants in each of the communities through snowball sampling, with interviews conducted using a semi-structured format [3]. We visited a number of times over the research period following discussions and analysis among team members. Interviews and observations were carried out by the team members and a student assistant. We endeavoured to interview all members of the community broadband initiatives who were available as well as some of the users.

Interviews were conducted according to the ethics policy of the University of Aberdeen and were all fully transcribed in order to be analysed by all team members. We used framework analysis to examine the results of the interviews as this allows an inductive as well as deductive approach to analysis and concept-building [22].

3. CASE STUDY COMMUNITIES

In the following section we briefly describe each of the case study communities before going on to look at how and why they developed community broadband initiatives. All communities have been given pseudonyms.

Peninsula Village is a community of about 850 people living at the end of a picturesque peninsula in the Highlands of Scotland. Its location means that although people can commute 30 minutes to the nearest town for work, they generally move there to enjoy small community life which is also fairly cut off. The influx of a bohemian middle class since the 1980s have made this formerly run down fishing village into a community of converted homes and a tourist attraction. Many artists and crafts practitioners were attracted to the community, which also set up a Community Trust and Community Arts Trust to help sponsor and administer community activities. The strong sense of local social cohesion is fostered by a good community information network, which is an outcome of the relatively good broadband communications. There is a nursery and a primary school in the village and there is public transport to the nearest secondary school not far away. There are two thriving pubs and many cafes and restaurants as well as a number of community halls and a youth café. There are a

number of small museums which rely on volunteer staffing. Although not wealthy, it is prosperous, but there is an area of social housing with more deprived population. The Community Council (a statutory body consisting of volunteers) provides a website, which has an astonishing variety of local events and activities listed.

Uplands Village is in a rural area of England including a population of c.1500 and a number of surrounding hamlets. It is made more remote from major centres of population than the distance (about 20 miles) would suggest because of its geography: it sits in a bowl made by the surrounding hills and can easily be cut off in winter. With the decline in its land-based industries during the 20th Century it has started to transform itself into a tourist destination and an attractive place to live. Some of the attraction is its landscape features and built environment with a steeply sloping cobbled street winding through the old market square and past the many pubs and weathered stone buildings. It particularly attracts people wanting to start small 'craft' businesses and those who value the sense of community and belonging that it nurtures. However, it is not a wealthy community with many 'for sale' signs on private and business premises and many people on social benefits and low incomes. The local schools, churches, library and town hall provide community hubs but public transport has been cut due to austerity measures so those without cars find it difficult to get out to find jobs or even get to benefit offices. There is a local museum staffed by volunteers.

Island Village comprises a community of 80 permanent residents plus surrounding settlements only accessible by boat or ferry. However, the numbers swell considerably in the summer. The main resources come from tourism and from management of the local estate, including deer stalking and forestry. The population of this community moved there from outside, partly in order to enjoy the secluded character of the region and the stunning beauty of the natural surroundings, consisting of lochs, mountains and small islands. However, their businesses depend to a great extent on information technology to reach potential visitors, including the yachting and hiking customers. The main meeting point is the thriving pub including a restaurant as well as the Island Trust offices which administer the estate and were the result of a community land buy out twenty years ago, something which is possible in Scotland. There is a small exhibition room that explains all this and a local café selling books as well as pottery and crafts made locally. The local store and post office operate part time so most supplies come from the mainland by boat deliveries. Self-sufficiency runs strongly in this community which has also developed their own sustainable energy sources. The broadband network will enable them to link energy and communications into an holistic digital monitoring service.

Though set in agricultural land, the *Commuter Village* is approximately thirty minutes' drive outside of one of

Scotland's largest cities. As such, it consists of a mixture of farmers and commuters. Commuter Village consists of around 800 people plus surrounding farms and hamlets. It is characterised by new build and converted houses purchased by commuters to the local city and nearby market town, many of them associated with the oil industry, which means that there is strong demand for good broadband services to enable residents to work from home on technology projects and communicate with family members when they are away. The high salaries provided in the oil industry means that the subscriptions for broadband could be set fairly high and lifestyles are rather privatised; people keep themselves to themselves or focus their social lives on the nearby market town 15 minutes' drive away [26]. The one local pub converted to an Indian restaurant and the lack of public transport means people are dependent upon cars. There is no school, shops or village hall.

4. HOW BROADBAND WAS PROVIDED

Communities used a combination of small private enterprise, non-profit organisations they set up themselves, contracting outside companies for some parts of the provision (for example laying the infrastructure) and their own labour. They tapped into government funding at local, regional, national and European Union (EU) level but also used charitable foundations and donations in addition to charging for subscription services. In the UK and the community broadband initiatives are mainly a response to the lack of provision by the handful of large telecom operators for whom it is not profitable to connect end-of-line communities, or the fact that the services they did provide were too expensive. For example, the early experiences with satellite communication in Island Village proved too expensive for low income communities. Community broadband initiatives therefore operate at the margins of the main telecommunications economy.

Three of the four case study communities used non-profit entities. These cover a variety of organisational models of and included co-operatives, where those working in the organisation as well as others could become joint owners and shareholders in the organisation and social enterprises, where profits were directed back into the organisation rather than going to shareholders. The aim of these enterprises was to provide services to members of the community as broadly as possible, although not all community members subscribed. All of them offered subscriptions to members of the community, who could use these organisations as internet service providers, but the costs and the level of service varied considerably. Local governments were important as facilitators in all cases, but did not seem to play the same role in initiating these developments as they did in North America. In the UK there were differences in this respect between England and Scotland since in Scotland there were a variety of state agencies who might help with these initiatives and laws which allow communities to buy up their own land. In England, the predominantly neo-liberal government has

mainly abolished the role of state agencies, so the legal and administrative model relied more upon setting up share ownership or finding charitable sources in addition to volunteer labour. In all cases, the access to EU funding, especially through the rural LEADER programme was critical¹.

Below we look at how this happened in each case, often through an evolving model.

4.1 Peninsula Village: from private company to co-operative

Although this was a for-profit model it enabled other subscribers and had implications for community development because of the services provided. In Peninsula Village the Internet company was set up in the early 1990s by a local woman who worked for the regional council as technology information expert. Her job was to travel through the region explaining to business and schools about the importance of the Internet and ICT. She realised that the upcoming technology would be crucial for redeveloping rural areas but was frustrated at the failure of the local and educational authorities to provide these services to local communities. She and her husband mortgaged their home in order to start a company as one of the first Internet service providers, first of all nationally and later internationally and this also facilitated her other consultancy activities. Although Peninsula Village is remote, it was conveniently situated near telephone exchanges that enabled these services to be provided cheaply and efficiently. Later as technology improved they replaced this infrastructure with a fibre optic line, which they financed and had laid to their business premises. The company was later sold and the couple moved away. The employees bought the company in this process and continued the business as a successful venture which has enabled further expansion into website hosting.

The result of these pioneering activities was that the local village was able to become a wired community which has a community website run for the benefit of the businesses and local organisations. Whilst the original aim was a for-profit venture, there was substantial spill-over into local social and community activities making this the village with one of the most active local community information website in the region and helping to develop further non-profit services. Although a private company, it was enmeshed in community relationships with a mission to provide community services.

4.2 Uplands Village: from co-operative to private company

¹ LEADER is an EU programme for rural areas which supports local, bottom-up initiatives. [9]

The Uplands Village community broadband initiative started operating in 2001 as a UK government's 'Wired up Communities' project to help people get online and access public services. It ran an internet drop in centre, providing training and support and set people up with computers in their own homes. The project was administered by the Rural Community Council for the county, and led by a local man who had formerly been the LEADER officer for that area. In 2003 the venture was constituted as an Industrial and Provident Society, a not-for-profit organisation run along co-operative lines. The original project leader continued to work for the organisation and acted, in particular, as the external face of the organisation. The community broadband organisation also has a pool of other regular, mainly local, workers who are employed on a more *ad hoc* basis. However, services were irregular and depended upon the availability of the local people involved.

In 2009 the community broadband organisation decided that fibre would be key to providing a high-quality broadband service in the future, and began work laying a fibre backbone between two of the villages it served. Local farmers were persuaded to dig trenches and lay the fibre optic lines. In 2012 they began work facade-mounting fibre around the centre of the Uplands Village in order to provide fibre link through the village. This involved negotiating wayleaves over more than 300 properties and all except two granted permission to do this free of charge, but the negotiations took a long time so the first services were provided only in 2013, but customers who received these services with fibre to their premises in the village relatively cheaply, were very happy with them.

However, the backhaul to the fibre cable in the second, more remote village proved more problematic and the task of providing these wireless services was eventually delegated to a commercial company, although the social enterprise still owned the fibre cable. By now it was competing with more mainstream internet service providers among the bit telecoms companies, so it was no longer the only internet provider and its services became more commercialised.

At the same time as having a high profile in external and national circles and a geography of provision that extends beyond their own territory, they also see their embeddedness in the local community as crucial. Their customer care is personalised by a well-known local woman and they employ local contractors wherever possible as well as providing a community website.

Since becoming an independent organisation the community broadband organisation has sought funding from a wide range of sources. They have created a patchwork of resources, predominantly from public bodies, but also through earned income and a community share offer. The public funding has been from many sources: EU,

UK government, local government, the National Health Service and Universities.

The organisation in charge of the project works closely with the local government, including sharing premises with them, but with the exception of some government funding they are an independent organisation. They are able to recuperate their running costs from their customers, through a relatively low cost subscription model, which even those on welfare benefits can afford. As mentioned above, when looking further into the ICT provision of these case studies, we observed that, though a co-operative model, the Upland Village community broadband organisations also acts like a private company when working to supply expertise, equipment and service to other communities.

The provision of the fibre optic service has been constantly delayed due to the nature of the search for funding (substantial sums were needed to lay fibre optic around the town and to an outlying village) and the temporary nature of this funding. Other delays were the result of having to negotiate way leaves and permissions from local property owners, not all of whom supported the project.

Most recently, this organisation has teamed up with a private company to provide the wireless section of the broadband, although some of the local board members and shareholders worry that this is moving too far from its original community orientation.

4.3 Island Village: part of a regional social enterprise

Another example of a co-operative is that of the Island Village where leadership was provided by the Community Development Officer, part of the Island Trust, funded by the regional development authority and EU LEADER funding. Originally dissatisfied with the quality of satellite broadband, the community leaders joined up with other small islands and regional remote populations to develop a broadband network based upon backhaul to the local University College. The local development officer together with some helpers set up a radio mast on a headland to receive the radio signals and then connected these through a buried cable to the village. The signal was then relayed around the village through transmitters on people's homes. Funding came from the EU financed LEADER project, the funds of the Island Trust and a local charity. Subscriptions are kept low, reflecting the low incomes of people locally, at £15 per month subscription with £70 set up fee.

This enabled local businesses to advertise their services and attract customers as well as bookings. The Island Trust owns rental properties and deer stalking operation, so they also benefitted from this facility. However, it did not result in a community information network, like in Peninsula Village, with communications provided instead by the pub, the post office, a café and a paper newsletter. Most of the work was done by islanders erecting their own masts and attaching transmitters to buildings but the work was stimulated by their participation in the regional net.

4.4 Commuter Village: a social enterprise but for how long?

Until recently, the villager's only option for broadband was through one of the large telecom providers and this was at very slow rates. Due to the building designs of certain housing, high speed broadband would never be available to the residents via the phone lines. A new resident moving to the village felt that it was difficult to live without high quality broadband, specifically due to his need to work from home. When speaking to neighbours, he realised that he was not alone in this. A number of other locals needed broadband for working from home, communicating with family abroad and the children needed it for homework (at the time, they had to go into a nearby town to complete their work). He organised a series of public meetings in the nearby pub to see if there was enough interest to put in an application for funding.

Once there were enough people willing to subscribe to the service, this community entrepreneur applied for and won a number of government grants which he used to construct the initial infrastructure. In the nearby city, he paid to have a cable laid from a main juncture to a disused radio antenna and used a professional contractor to lay the cables and set up the Ethernet. The signal is beamed from this antenna to a receiver on the outside of the village, then re-beamed to a number of repeaters around the village. Customers had to pay to have microwave receivers installed on their houses, and then pay a monthly fee to receive one of two levels of broadband. There were three bands of subscription and although services operated of up to 100mb, allowing streaming of audio visual material and Internet TV, the subscriptions were fairly costly at £100 per month for the highest band, although lower bands provided lesser services.

The service has been slowly extending out from the initial receivers as more members of the network come online and bounce the signal on to neighbours. Recently, the project has taken on a full-time member of staff, but until then a majority of the work was done either by the original entrepreneur, a few volunteers or paid contractors on an occasional basis. However, the local customers treated it more as a commercial broadband provider and demanded round-the-clock repairs and servicing that the social enterprise could not always provide. They did not always see it as a community-run enterprise.

The social enterprise set up by the village proved that there was a demand for super-fast broadband, but now one of the main telecom companies are setting up in competition to provide this service, thus undermining the community initiative. It is probable that these more commercial services will take over in the near future.

5. GENERAL FEATURES OF THE COMMUNITY BROADBAND INITIATIVES.

What were the common factors that made these community broadband initiatives successful? Here we can identify five

main features which we characterise as types of capital. First of all, *human capital* was important since it was the leadership of one or more community entrepreneurs that enabled the community broadband initiative to happen. In the case of the Peninsula Village took the form of a private company set up by an enterprising couple. In the Commuter Village a private individual set up the social enterprise, in Uplands Village a local social entrepreneur who lived locally and had worked on the Uplands Village's LEADER programme set up a co-operative. In Island Village the local development officer was active and enterprising in working with neighbouring communities to set up the digital connections. However, as Pigg [13] has pointed out, one person is not sufficient for successful community mobilisation. All of the community entrepreneurs were able to mobilise local networks and were respected members of their communities with strong social capital as well as human capital. They represented a model of successful community leadership.

Each of these community entrepreneurs was able to harness local expertise and enthusiasm, often from educated people. Three of the four community entrepreneurs held higher degrees themselves, but the level of education in the surrounding community was quite high partly reflecting the gentrification of the rural neighbourhoods encouraged by in-comers over a period of decades in search of better quality of life [6, 8]. These incomers were often discontented with what the locality provided in terms of technology infrastructure or were keen to work from home as part of their professional careers. They brought with them external social capital and new skills and expectations.

An aspect of human capital that was an important element here was that of *technological capital* because someone must know how to set up these networks and link them to other media. In the case of Uplands Village, the initiator had previously worked as a telecoms engineer. In other cases it was the proximity or link to people from local Universities who provided the expertise or the funding or both for these local broadband initiatives. In the case of Peninsula Village an outpost of the local University helped to enable better Internet services and the expertise of the original community entrepreneurs made it possible, whilst in Island Village, it was a local University project that helped set up the network and the initial broadband was provided through a link to the University network. Therefore, links to local Universities could be important but were not present in all cases.

Another type of technological capital that was necessary were skills associated with basic building work. In these rural areas, many of the local families live on farms or crofts, with the associated agricultural equipment (tractors, diggers etc). People with these skills and tools were needed to dig trenches in order to lay the lines, cut down trees to allow line-of-sight for wireless. These are technical skills and work that could be purchased, but are community

broadband initiatives were able to source them communities directly free of charge.

Social capital was a key ingredient of community broadband initiatives as in other civil society developments [17]. Social capital took two forms: external and internal. External social capital corresponding to what Putnam has called “bridging social capital” enabled links to be made to outside agencies, such as local authorities but also funding agencies. This was an important element of the expertise that local community leaders brought to these initiatives. In several of these case studies, the publicity generated enabled the communities be seen as glowing examples of local initiatives that became quite famous nationally, being mentioned in government reports and documents as well as being the subjects of newspaper articles and television coverage. Internal social capital refers to the ability of community leaders to tap into networks and resources within each community. This was important because the community broadband initiatives needed to be able to link into different constituencies within the community. Knowing who could do what and knowing how to engage them was a key aspect of getting the initiatives working. Rural communities are often characterised by this dense set of interlocking social relationships .

A fourth feature is the commitment of the community, which we have termed “*identity capital*”. People who move to remote rural places have chosen to live somewhere and are often very committed to building those communities and making them work [25, 27]. The remoteness and distinctiveness of these locations helps to give them a distinctive identity. In Peninsular Village, Uplands Village and Island Village, residents were committed to building their community and had a strong sense of loyalty to it. There have been studies of how urban areas which attract a ‘creative class’ of people help to foster development through creating an attractive neighbourhood to settle [4]. A possible factor in the success of some of these communities is the presence of a bohemian middle class with strong cultural links to a concept of place and enthusiasm for creating a desirable locality. Although not generally high profit enterprises, small creative industries have a need for high bandwidth communications to transmit their work to a wider world. In the case of Island Community the Community Trust had bought the land for the community, something which is possible under Scottish legislation, which encouraged this kind of ‘localism’ and place-making [21].

Even though each of the community broad band initiatives drew upon popular support and volunteer labour, they would not have been possible without some injection of *financial capital*. Since none of these community entrepreneurs were wealthy individuals, accessing financial capital was a question of applying for grants or mobilising share holdings. Much of the literature is concerned with how public policy can help to create smart communities. However, in the case of these communities we can observe

that it was the deployment of a variety of resources rather than one single source that was important. This could include grants from the EU, grants from local authorities and agencies, use of charitable income and own investment, with public policy playing only an enabling role. In the UK, the variety of different funds available at local, national and EU levels mean that community leaders are those able to tap into this patchwork of resources successfully.

Unlike the examples provided by Pigg and Crank, it seems that municipalities played more of a facilitating role rather than an initiating role. However, state funding from the Scottish regional Government, the EU through various schemes (especially the LEADER funding) were significant in enabling these initiatives to get off the ground. The fact that this funding is generally short term, however, jeopardises the sustainability of at least some of these projects.

6. CONCLUSIONS

The paper has looked at factors shaping the success of community broadband initiatives across different regions and different terrains. Since there is no one model as to how these initiatives begin or develop, we have highlighted the importance of the kind of organisational models they embody, the kinds of purposes they serve and the organisational and community structures in which they are embedded. Whether privately, socially or community driven, the different community broadband initiatives have all aimed to bring services to their local community, which may not have been provided otherwise. These community broadband initiatives have not been examples of local authority of municipal initiatives as seem to happen in North America, although they may have been facilitated by local authorities and public policy. This may be because local authorities in Great Britain have little fiscal or other autonomy and the funds on which they draw have been cut during a time of austerity budgeting so that they limit themselves to providing statutory services. Or it may be that these communities were too small to count as statutory fiscal regions in themselves.

The initiatives that we considered in a rural UK context did not fit easily with Pigg and Crank’s or with other typologies of broadband provision found in the literature. They tended more to be hybrid arrangements between local businesses, social enterprises of various kinds and local community actors, so it was necessary to take account of the social organisation of the locality as well as the business model adopted. Each of these has different implications for the initiation and development of community broadband and are fostered by particular policy environments, which also differ between England and Scotland.

Communities have drawn to a great extent upon their own resources, using five different capitals: human, technological, social and financial. Community entrepreneurs were important as leaders who can mobilise

these skills and resources both within and outwith the locality. The fact that these were all attractive rural locations which brought in new populations committed to building lives there, helped to create a sense of identity and social purpose. However, the introduction of fast broadband connections helped to develop the communities in different ways and their stories are still unfolding.

We can see that there is no one model of how these communities develop, but rather a mixture of private and social enterprise, with organisation shifting from one to another over time and as technology and other opportunities change. The fact that they depend upon particular local actors able to mobilise various kinds of capital means that they are not a universal model for ICT development for the final 5 per cent of premises throughout the UK. They are the exceptions rather than the rule. They are further rather fragile in the sense that if the key actors leave or resign, or if funding dries up, their long term sustainability is jeopardised. On the other hand, if the business model is successful, they may get supplanted by the big telecoms companies, which is what is likely to happen in Commuter Village. Perhaps one important legacy of the community broadband initiatives is in the mobilisation of the community itself to access this resource.

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