

Broadband Demand Aggregation to Accelerate Regional Economic Development

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Abstract

Adit North is a UK Government initiated, regional partnership focussed on aggregation of demand, procurement and commissioning of broadband networks and facilities spanning some of Britain's largest metropolitan centres and England's sparsest rural communities.

This paper positions the initiative within national and regional economic strategies together with information society developments over recent years.

It contrasts experiences in the north of England, where it was possible to build on previous relationships and developments, with other regions that have found difficulty in starting from scratch.

An extensive regional communications network will be illustrated with cross-sector partners providing services and support to businesses and the public sector.

Early achievements and projects are reviewed, including: -

- ADSL enablement of remote and rural exchanges, providing >99% availability to the population served
- Real Broadband. Regional collaboration to bring fibre connectivity to the kerbside for homes and businesses.
- The Northern Internet Exchange, a resilient fibre link from the north of England to London and international services/markets.

The paper includes frank discussions of lessons learned along with how some of the residual obstacles may be addressed. This includes some pre-requisites for success together with cultural and organisational behaviours that influence the 'competition/collaboration paradox'.

Key words - Telecommunications, networks, procurement.

Introduction

A Regional Perspective

More than forty years after the recognition of the need for a new economic model, the North of England is now attacking the change from a strong industrial society into an information society with investments of sufficient scale to accelerate social, cultural and economic development.

The North of England has a rich heritage stemming from the industrial revolution and indeed much earlier. The Lindisfarne Gospels were transcribed in monasteries on the banks of local rivers in the middle of the first century AD, and represent a much earlier knowledge and information revolution for communities in Europe.

Later, these same rivers and their hinterlands became one of the major engines of the industrial revolution. They were also centres for innovation and invention, bringing to the world the electric light bulb, the railway locomotive, the steam turbine and hydro-electric power generation amongst other notable firsts.

Until the early nineteen-sixties the region's economy was reliant on shipbuilding, mining, manufacturing and heavy engineering. Since then the rapid decline in these sectors has seen a drift towards a service economy, with only specialist niches of high-value added, high technology manufacturing and research. Although there have been some significant individual success there has been no success in bringing the England's most disadvantaged region into the mainstream national economy.

The information age heralded another opportunity for collective investment to leapfrog a failing region into the vanguard of value-added service providers. Ten years ago committed leaders from all sectors of society in the region collaborated to pool their efforts in developing a truly holistic strategic framework for the transition to an Information Society. As a result of this work, Prime Minister Tony Blair launched the Regional Electronic Economy Programme for the North-East in 1999, as a UK pilot.

This programme stemmed from a full cross-sector strategic framework and focussed investments into three generic strands;

- Developing people and communities
- Developing information and knowledge sharing facilities
- Developing access and connectivity

Even with such support it has been difficult for institutional frameworks to respond to holistic, cross-sector investment and collaboration requirements and implementation has been piecemeal at best. Although disappointing for those who have championed fundamental change, it should be recognised that cultures, behaviours and above all, the need to change to joined-up government and governance have inertias that do not respond quickly to pressures from those who are regarded as challengers.

With the advent of the Adit initiative there is a body with the mandate to pull together the public sector provision of broadband communications services. Although not quite holistic this is underpinning major developments the other two main strands of the information society in the region.

Background to Adit

In 2002, the UK Government surveyed its Departments to determine their procurement practices regarding the ever growing spend on broadband and related services (over £1 billion per annum). It found that Government Departments had a piecemeal approach to procurement, with many small local contracts being let rather than any co-ordinated approach.

The UK Treasury concluded that smarter procurement should lead to savings of at least 20% and tasked the Department of Trade and Industry to work out the best means of achieving this smarter procurement. In November 2002, the Secretary of State, Stephen Byers, announced the formation of the UK Broadband Task Force, which would work with public bodies around the UK to agree the best approach to consolidating procurement practice.

By June 2003, agreement was reached to create broadband aggregation bodies in the English regions, whose boundaries would be common with the Regional Development Agencies to maximise the economic development opportunities. These aggregation bodies are the Adits.

Over the last 2 years, some consolidation of Adits has occurred, with Adit North East becoming the largest procurement body serving 5 of the 9 English regions.

Adit Generic Priorities

Adit has 3 major priorities for all business activities:

- a) aggregating customers' requirements to deliver better value solutions
- b) leveraging buying power to deliver economic development benefits
- c) improving competition between telecommunication suppliers

Whilst procuring lower cost connectivity for public sector bodies still forms an important part of Adit's work, economic development activity has become the primary focus. The two main activities in this area are the Transformational Model and the Northern Internet Exchange (NIX).

The transformational model was developed after looking at what countries around the world were doing to enhance business and citizen access to next generation broadband services. It was found that all significant projects were led by a public sector intervention to assist in infrastructure development, which was then the spur to private sector innovation in applications and services. Best practices were taken from these other locations, and applied to UK situations, leading to a robust business and financial model applicable to any UK region and elsewhere.

The NIX was developed to overcome high connectivity costs in Northern England compared to London and the South East. One of the major reasons for this price disparity is “backhaul” costs as Internet traffic needs to be routed the 300 miles from the region to the London Telehouse. As a spur to regional investment it was necessary to remove this backhaul overhead. Working in partnership with the Regional Development Agency, the NIX was constructed. The facility is located at two sites, both of which are full collocation centres with multiple telco provision. The two sites are linked by fibre and have resilient, diverse fibre links to the London Telehouse buildings.

National and European Perspectives

The European Commission has long recognised the significant potential of the creation of an Information Society and latterly, a Knowledge Society as a route to a prosperous and inclusive Europe. The last three Framework programmes have included ICT elements and some support for Regional Information Society strategic studies as a route to accelerating economic development at regional, national and European levels.

Europe’s political leaders have recently endorsed this view and have reached agreement on positive action programmes to move forward along this route. The Lisbon agreement was a cornerstone of building such an inclusive Europe. Although progress is widely agreed to have been poor, the information society aspects of the Lisbon agreement have been re-launched within the i2010 agenda championed by Commissioner Viviane Reding.

In September 2005, in London, she confirmed her belief that the contribution of ICT to the EC policy of more and better job creation was crucial. In addition the critical position of ICT as a business sector in its own right, representing 5% of EU25 GDP was confirmed together with the belief that this 5% drives 25% of overall growth and about 40% increase in productivity. Commissioner Reding also said that in making the digital economy and innovation two of the central pillars of i2010 she hoped that more widespread and efficient use of ICT throughout the economy would help the EU to preserve its global competitive position.

In the supporting actions for i2010 there are proposals to review regulatory instruments to look for scope to meet modern needs and new ways of doing things. This recognition of the fundamental importance of developing digital economies and freeing up the routes to achievement is heartening. A major challenge will be to develop common purpose in this area across national, regional and local public administrations.

In the UK, the government has always been a supporter of the development of an information society and a digital economy. Only recently with initiatives like the national broadband aggregation project has it found a way to bring together economies of scale that can have significant impact on economic development time-scales.

As can be seen from the above, whilst it has been slow to come, there is now political and structural support from both the EU and UK Governments in delivering economic growth through ICT investment. Recognising this, Adit has developed its business activities to

demonstrate what can be achieved by a strategic focus in these areas. Two of the best examples of such activity are summarised in the following case studies.

Case Study 1: South Yorkshire Transformational Model

The Adit transformational model for regional economic development through next generation broadband investment was taken by the public bodies in the South Yorkshire sub-region and is rapidly becoming one of Europe's largest projects in this area with 1.3m citizens and 40,000 businesses identified as potential beneficiaries.

The South Yorkshire High-Speed Broadband Project has 4 main aims:

- To **offer the public sector better value broadband** connectivity and services (such as “Voice over IP”, data storage, backup and disaster recovery) than current, using the aggregation of public sector demand on a common high-speed broadband infrastructure as the catalyst.
- To provide **an open platform** to deliver the benefits of World-Class broadband services to Small and Medium sized Enterprises (SMEs) across the sub-region, **improving the attractiveness of South Yorkshire as a location** for Information Communications and Technology (ICT) driven business investment.
- To support the **education and skill development of individuals** disadvantaged by social circumstances, gender, disability or location through cost-effective broadband services.
- To **accelerate investment** by telecommunications service providers within the region to upgrade and extend their broadband service using the **minimum necessary intervention** by the public sector.

To comply with UK and EU State Aids and Competition Law, this will be achieved by creating a regional open wholesale broadband platform using the OJEU competitive tender process offering approximately 30Mb/s to end users. The infrastructure will be controlled by public sector partners through a Special Purpose Vehicle (SPV), which will lease an irrefutable right of use over the network.

Operational Benefits to the Public Sector

The principal benefits of the South Yorkshire High-Speed Broadband project for the public sector are the provision of higher bandwidth connectivity, to more sites, with appropriate security and resilience, at lower cost well ahead of ‘non-aggregated’ purchase timescales. The network design enables additional shared or value-added services to be offered to public sector users, such as Voice over IP between public sector users on the network and off-the-shelf disaster recovery capabilities.

Commercial Model

The diagram below shows the main components of the networking infrastructure together with the services they present to customers.

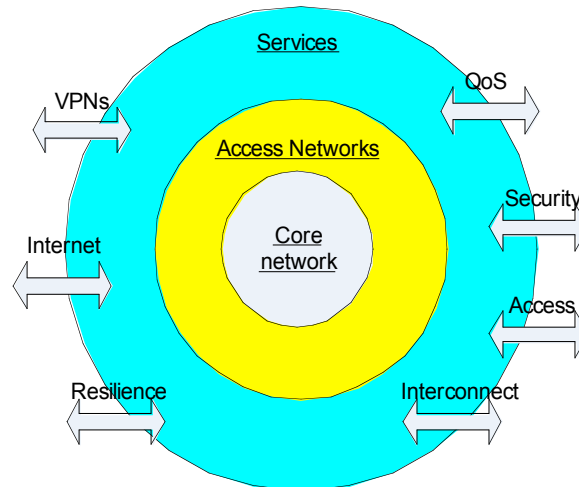


Figure 1, Infrastructure Overview

The underpinning commercial model is based on 4 levels:

Level 1 – Public Sector Connectivity

Public Sector users will have the right to use the Core, Access and key services (e.g. Internet access, VoIP, resilience, security etc) at a published tariff based on “cost” (i.e. the fully allocated cost of the elements of the network being used including overheads). The cost will be set by a Special Purpose Vehicle (SPV), whose membership will be comprised of public sector users committed to using the network. Public sector shareholders in the SPV will receive preferential connectivity prices (and/or dividends) over non-shareholders.

Level 2 – SMEs and SDPs

SMEs within the region will be able to subscribe to the Core and Access Networks at a published tariff based on a “cost plus” basis. The tariff will be set by the SPV, which will ensure that unfair cross-subsidy with respect to private sector providers does not occur. Services (e.g. internet access, mail and web hosting) will be provided by private sector Service Providers, who will contract directly with the end-user. It is likely that the BT Wholesale model will be adopted which requires Service Providers to recover the Core and Access charges on behalf of the SPV.

Level 3 – Internet and Applications Service Providers

Private Sector Service Providers will be able to provide services to any user of the network at a published tariff based on a “cost plus” basis. This will allow Service Providers access to the core network and guarantee speed and quality of service to them and the end users. The tariff will include connection and transport charges, and will be set by the SPV. The SPV will set and publish the minimum acceptable technical and content standards (e.g. legal and moral).

Level 4 – Wholesale

Excess bandwidth on the Core Network throughout the region will be available to any Service Provider (including telecommunications companies) on a wholesale “cost plus” basis at a published tariff. The tariff will include connection and transport charges, and will be set by the SPV. The SPV will set and publish the minimum acceptable technical standards for interconnection.

Conclusion

The South Yorkshire sub-regional Investment Plan analysis and Business Link statistics indicate that economic impact data from similar national and international ICT initiatives can be translated into the South Yorkshire sub-region. Whilst there are some variations, the data is reasonably consistent.

The economic impact over a 20 year period of the proposed ICT investment project using public sector aggregation and EU ERDF funding is estimated to be approximately:

Year	3 yrs	10 yrs	20 yrs
GDP Increase	£45.2m	£265.6m	£622.5m
Job Increase	4,490	7,285	10,173
<ul style="list-style-type: none"> • These figures do not include ‘indirect’ effects and only some of the ‘induced’ effects. Their inclusion could raise the jobs and GDP data by 50% or more. • The figures do not include inward investment and transformational cluster development. If these are prioritised and pursued, each is so significant that a 30% success rate could lead to a minimum 20% increase in jobs and GDP per capita based on experience elsewhere. 			

Table 1 South Yorkshire Transformational Model after 3-10-20 year periods

Case Study 2: Northern Internet Exchange

The North East of England is committed to becoming one of the leading European regions in ICT developments, which it believes will accelerate the ongoing renaissance seen in the last decade.

One area of particular interest at present is in marketing the region's capabilities as an international centre for both disaster recovery and business continuity. The Regional Development Agency, OneNorthEast, has established ETR²A (European Telecommunications Resilience and Recovery Association) to further this opportunity and there is significant interest from both European and US-based financial institutions in locating recovery and resilience facilities within the region. In particular, it is considered that there is a strong demand for cost-effective international telecommunications links to New York.

Whilst the North East has the necessary skills base and facilities, combined with competitive land and employee costs to further its ambitions in this area, it has been disadvantaged by its relatively high cost data communications due to the 300 mile back-haul overhead to the UK's international hub in London. An IP Exchange will bring multiple IP transit providers to the North East, providing access at London prices for wholesale IP transit buyers in the region.

The region has developed its network of (seven) existing co-location facilities under a single brand, NIX, with the two major facilities being located in Sunderland and Newcastle. Discussion with the owners of these two facilities has resulted in an agreement to make the Newcastle facility the IP exchange, with a spur connection to the Sunderland facility.

This connectivity will encourage overseas organisations and business to utilise the world class storage and Disaster Recovery facility recently established in the North East region at Databanx in Newcastle and also Local Authority hosting facilities at Doxford Park in Sunderland.

The provision of this service forms the foundation stone on which to build additional services, applications and connectivity for the region and ultimately assist in making the North East region an exemplar in Hosting, Data Storage and Disaster Recovery.

The NIX is also of major benefit to organisations, both public and private, which come under the requirements of the UK Civil Contingencies Act 2004.

The Civil Contingencies Act came into force in the UK on 18 November 2004. The main issues from a telecommunications and Information Security perspective are:

- An Emergency can be declared if human welfare and/or security are threatened by disruption to telecommunications.
- An assessment of a risk of Emergency should be made

- Plans should be in place to recover from such an Emergency
- The risk assessment and plan should be published if required
- These aspects of the Act apply to Public Bodies and Utilities (including telephone, telecommunication, network and information managers)
- The precise boundaries of those companies covered by the Act in the telecommunications and security arena have yet to be fully tested. Until such time it is wise to assume that the ‘Category 2’ responders the Act refers to embraces all providers of public services.

ADIT works with regional partners to advise on the implications of the Act for Category 1 (Major Public Sector Bodies including Health Service Telecommunications) and Category 2 (Utilities) responders.

The NIX is the ideal service to solve many compliance issues facing organisations and already many public bodies use it as such, including its growing use as a shared disaster recovery facility.

Lessons learned and Major learning points

- Importance of a strategic frame work and personal networks.
Adit was able to have a flying start in the North of England because there existed a strong strategic framework for the development of an information society together with extensive personal networks of key players who were able to commit to rapid action in support of broadband aggregation. In many other regions of the UK the Adit initiative fell on stony ground because it did not have either context or commitment within regional ‘power networks’.
- Action usually happens at sub-regional level.
Although regional commitment and support is an essential pre-requisite of success, major developments usually happen at the sub-regional level because there is sufficient autonomy and ownership without the inertia and conflict usually associated with wider regional consensus brokering. Also political will and territorial scale play a major part in championing change. Our experience in developing transformational projects has again demonstrated the strength of a sub-regional approach.
- Squaring the Competition-Collaboration Paradox
One of the key sticking points for past large-scale developments in the information society arena has been a failure to collaborate for the good of people and communities because key players could not recognise when to compete and when to collaborate. In addition the fear of relinquishing total control over an area of service, coupled with ‘not invented here’ mentalities have been past inhibitors.

- A neutral body like Adit has resulted in a facility which helps public administrations to pool some of their efforts and resources for the common good. Current collaborations allow partners to acquire good networks, platforms and services. It still allows them to compete on excellence of service to citizens and businesses. It also allows partnerships to enter as new competitors as larger economic units in national and international marketplaces.
- New political and administrative perspectives are still crucial
Even with the ‘instant’ success with the Adit initiative, which is based on simple common sense applied to pooled resources, there are still political and administrative views that look for two year windows of returns, use inappropriate regulatory instruments and fear success.
The Lisbon review team and Commissioner Reding have proposed expediency in execution of the agenda and have undertaken to look again at appropriate regulatory regimes. This is required urgently, especially in the area of state aid, if momentum is to be maintained.
- Benefits must be accrued in the short term even for long term projects
It is perhaps an obvious fact, but seems to be often overlooked, that political and executive leaders need to see a short term gain from any strategic investment or it will fail to be given priority amongst the mass of other initiatives. Some early work relied on regional leaders “seeing the long term benefits” of our proposals: they did not. Only when short term gains were definitively demonstrated to each stakeholder organisation was backing received for strategic projects.
- Don’t be seen as promoting technology solutions
Most leaders and decision makers, are not technology literate. Elegant technical solutions to social and economic issues are irrelevant to them if the benefits cannot be described in a straightforward way – especially in terms of simple, everyday business or citizen benefits.
- Financial benefits are not always enough
The Adit aggregation model for procurement has demonstrated time and again substantial financial benefits to its public sector customers – usually about 20% of contract value. However, there is a loss of control perceived by public bodies when they hand over their procurement needs to us. Significant efforts need to be made to ensure this does not become a barrier to work. To this end, developing strong relationships with both the technical and legal departments within such organisations is advocated so that they become comfortable with what Adit does and the way in which it is done. Keeping stakeholders “in the loop” whilst saving them both time and money pays dividends in the form of trusted relationships.
- Get the balance of the team right
The Adit in North East England was one of the few which balanced their staff between public sector and private sector (telecommunications industry). This balance

has been crucial in our success as we have been able to communicate effectively with both customers and suppliers, in language they understand and are used to. Only the Adits which did this still survive, the others (which were solely staffed from the private sector) have been closed down as their public sector stakeholders could not engage in meaningful dialogue with them. As a result Adit North now procures broadband services in 5 of the 9 English regions, having taken over the responsibilities of the original Adit in these regions.

Summary and Conclusions

There is no doubt that a marked shift has occurred within the European Commission and UK Government with regard to their confidence in major ICT investments generating economic growth. In addition, the UK Government has seen that broadband aggregation across the public sector results in:

- a) cost savings for public bodies
- b) economic development opportunities
- c) improved competition between telecommunications suppliers

Adit has been the vehicle of choice in the UK and now has a 2 year track record in proving the above benefits. As confidence among public sector stakeholders has grown, more significant initiatives, such as the transformational projects and the NIX have arisen which act as accelerators in accruing economic and social benefits.

Experiences to date have led to the following conclusions:

- a) a neutral public sector body, such as the Adit, is an ideal mechanism for a broadband aggregation strategy – with 20% cost savings being the initial benefit
- b) local support for such a body is a vital precursor to its success
- c) staff within the Adit should be drawn from both public and private sector – a weakness in either leads to a cultural clash with either customers or suppliers
- d) the Adit model should be transferable to any country seeking to mature its telecommunications market through measured public sector intervention
- e) major transformational projects, delivering significant economic and social benefits, become possible through such a neutral body. Again, the financial and business models for such projects should be transferable to other countries as they are not UK specific.