

The Role of the Region in Knowledge Transfer for Economic Development

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Abstract. This paper outlines the increasingly important role of regions in Knowledge Transfer. Drawing on experiences from two ICT projects involving Digital Ecosystems, it explores why the regions are the best catalyst for knowledge transfer and suggests methodologies for the development of effective ICT strategies for regional economic development.

Keywords: ICT, regions, regional economic development, SMEs, knowledge transfer.

1 Introduction

The increasing globalisation of economic and cultural activity, underpinned by the Internet and other media that transcend geography, could lead one to believe that regions, the traditional geographical units of government and community, are outdated and no longer necessary.

However, as we shall see in this paper, the opposite is true. Regions have an increasingly important role to play and should be encouraged to develop the specific qualities that make them effective in the adoption of new and emerging technologies. Indeed, what we call a region may well change over time; from a unit that is defined by historical or geographical convenience, to one that is dynamically defined by economic potential and knowledge transfer activity.

More specifically, using knowledge gained from two international ICT projects that developed a particular model of regional participation, we will see how the next generation of Internet technologies, Digital Ecosystems, has a strong basis in devolution and democracy, which naturally lends itself to the direct involvement of regions and regional actors.

We will also look at specific techniques that provide a practical model of how regions can approach technology development and adoption, and how individual regions have leveraged their diversity to find their own ways to rise to the challenge presented by the leading edge of ICT.

2 Regionalisation as a Reaction to Global Change

Before delving into the specifics of knowledge transfer, it is worth looking at what may be on the wider horizon for regions.

In his book 'Jihad v McWorld'ⁱ, Benjamin Barber points out the irony of Jihadists carrying out their anti-Western bombings wearing Nike branded trainers. He argues that the two extremes of globalisation and tribalisation are in reality a counterpoint to each other and will probably always co-exist: global consumerism producing an increasingly sterile and homogenised 'McWorld' against which stronger localisation satisfies the human need for identity, roots, history, and a sense of belonging.

As well as the psychological need for local communities, there is an increasing imperative due to global issues such as food shortages and climate change. The UN Food and Agriculture Organisation in its 2009 November summitⁱⁱ called for more food to be produced closer to those who need it, and warned of a threat to security of supply for those dependent on imports, especially from countries that may be adversely affected by climate change. Transporting food great distances is also becoming recognised in the public conscience as an unnecessary contributor to fossil fuel consumption and the personal carbon footprint. This means that we can anticipate regions becoming more self-sustaining and operating across a wider range of activities.

Finally, within all but the smallest countries, many organisations and associations find it advantageous to have a local presence via 'branches' and 'groups'. This recognises that, while representation has to be carried out at national and supranational level, localisation of relations with members is better than trying to serve heterogeneous end-users with the homogeneous output of a centralised facility. The motivation that comes from being able to make a visible difference within your immediate environment means that organisations with a regional network are able to tap into volunteer energy and a wider range of skills and personalities.

So, despite globalisation and digital media, there are a number of general current trends that indicate that the region is far from dead. Let's now look at the specific qualities that regions bring to knowledge transfer.

3 Value in Diversity

Across the world, regions are so different in their size, structure, authority, power, resources, culture, history, and behaviours that one region might hardly recognise another as its counterpart. However, this lack of uniformity is what underpins the value of the region as a conduit between global technological progress and local practical application. The 'one size fits all' solutions that are likely when thinking on a national or international scale fail to recognize the diversity and the complexity of adapting initiatives and programmes to it.

One might suppose that the European Union, which has often been called a 'Europe of the Regions' would have some consistency, but in fact there is huge contrast between, say, the powerful federalist states of the German Lander, the subjugated, purely administrative role of the UK regions, and the smaller nations like Finland that behave as if they are simply one region.

As an example, I would like to contrast two regions that participated in Digital Ecosystems. Both are located in developed countries within the EU, yet due to their fundamentally different environments they adopted different approaches to being partners in Digital Ecosystems research.

4 Contrasting Two EU Regions: UK's West Midlands v Spain's Aragon

Despite being research projects, DBE and OPAALS, of which you will hear more elsewhere in this conference, both managed to successfully involve regions and their SMEs. Before we look at the generic principles that we established from this participation, let us take a moment to contrast two of the participating regions, both of which are from well-established EU Member States.

West Midlands

The UK's ancient history is one of feuding regional kingdoms and successive invasions to produce a densely-packed mongrel nation within a small island. Much of its subsequent political history has been about uniting England, Wales, Scotland, and Ireland. Although it is now being reversed to a modest extent by the creation of 'regional assemblies', much of the UK's modern history has been about unity at national level, and regions have been purely an administrative convenience: a way of dividing the country up into manageable chunks, reflected in invented regional names like 'West Midlands' which have no geographical, historical or cultural sense of identity.

Under Prime Minister Margaret Thatcher, The UK had a long period of anti-interventionist government during the 1970s and 1980s, during which many state functions were moved to the private or non-profit sector. This produced a more lean and fit organisational landscape but also produced duplication and competition among agencies, and confusion among businesses.

Thus when the UK West Midlands wanted to participate in the Digital Business Ecosystem project the participation was led by one of the region's universities, who in turn had to get funding for their participation from the Regional Development Agency and other sources. These funding sources each had their own agendas, and so participation was a matter of appealing to those agencies and accommodating their various individual interests. Interestingly, there was no restriction on working outside their region, and so they also covered the neighbouring East Midlands region and were even able to bid (though unsuccessfully) to set up and operate a national Open Source centre.

The university did not have day to day contact with SMEs and so had to engage other agencies, specifically a kind of industry IT club, to help to attract SMEs to events and identify target adopters. Thus the core role of the university was to bring together the various funders and SME agencies in a complex landscape, and it took on two new staff specifically contracted for the project.

Aragon

Spain also had a turbulent past, finding itself, since pre-historic times, at a crossroads between Northern Europe, the Middle East, and North Africa. General Franco governed Spain as a Fascist dictatorship for almost 40 years from 1939 to 1978, when the transition to democracy brought a sharp reversion to former regional kingdoms, with substantial devolution of power and autonomy. For economic development, such autonomous regional governments tend to operate through their own tied agencies, although these may be constituted as independent not-for-profit companies.

The region of Aragon has an ICT agency, ITA, which decided to become involved in the Digital Business Ecosystems project. Although constituted as an independent not-for-profit company, ITA is in effect owned by the regional government and enjoys a monopoly status on ICT development. IT formulates the government's regional ICT plan, delivers government funding to SMEs, as well as providing advice and involving SMEs in projects. As such they enjoy massive long term 'social capital' with SMEs and an established working relationship with many of them.

ITA was able to directly contact suitable SMEs and to command their attention and respect, based on its past relationships. The other side of this position is that they have been anxious to preserve this 'social capital', especially when research has failed to meet its time scales or objectives and the SMEs were in danger of becoming disillusioned. ITA has also been able to mobilise complementary government funding for implementation, and so, largely as a result of its stable, central position in regional ICT, has been able to take a long-term and holistic approach.

5 Matching Initiatives to Environments

Both West Midlands and Aragon achieved considerable success in bringing SMEs into the research and exploitation. The main point is that they did it in entirely different ways, adapting to their local situation.

A key ingredient for success is to understand the interplay of action and environment and how to modify and adapt for different local situations. Throughout Europe, many knowledge transfer initiatives have been demonstrated to be effective. The methodologies have been published and others have been keen to adopt this 'best practice'. However, the transplanted initiatives have often failed. The root cause of such failure is normally that the environment is different. This is where the region has an invaluable role to play, providing that it understands its own environment and how it differs from others.

There is a good analogy with farming: the crop that thrives in the soils of one region may quickly wither and die in those of another. As any farmer knows, it is a question of knowing your own environment and of putting the right crops in the right conditions, although with intelligence, knowledge, and some investment, there is a limited degree to which one can change the environment to suit the crop. Thus if one region achieves success in a particular environment it may be that other regions can construct a similar environment and use it equally successfully, or change the nature of the initiative in order to adapt it to their own environment. To continue the analogy, this would be the equivalent of selecting a different variety of a crop to suit the local soil and weather. The main point here is to study and fully understand why and how an initiative or methodology works. This involves researching both the initiative and its interaction with its environment. Even a scheme that has never before enjoyed success may become a star if it is transplanted into a sympathetic environment.

During the DBE and OPAALS projects, much work was done to produce analyses of the regional partner's environments, focusing in particular on human and organisational networks. This knowledge is available and should inform regions that are developing ICT strategies, or for that matter any knowledge transfer strategy. During this analysis, working with these and other regions, some important generic concepts were developed and employed project-wide, which we will look at now.

6 Important Generic Concepts

Regional Catalysts

While each of the DBE and OPAALS regions rightly approached their participation in different ways, a common concept was that each had a single organisation that was able to act as a 'catalyst', in the sense that the organisation itself remained unchanged, but it facilitated the desired interactions between the project and local actors. This concept became known as the 'Regional Catalyst' and has provided an enduring model of regional engagement that can be readily transferred to any size or type of region, and does not only apply to sub-national level. Indeed, IPTI, the conference organiser, is our very successful Regional Catalyst for Brazil.

Translating activities into local culture is also an important role for the Regional Catalysts. From simple things, like language translation, to more subtle translation of research messages into business language. In the reverse direction, the Regional Catalysts have an invaluable role in articulating the needs of business and translating them into research language, such as by developing use cases, and providing interpreted feedback. These inter-language and inter-cultural barriers between research and industry cannot be over emphasised. They can cause a complete breakdown if ignored.

It is best that Regional Catalysts are existing organisations. Most regions have some existing infrastructure that can be leveraged. New organizations are a last resort, as they can suffer from many disadvantages and risks:

- Lack of 'social capital' within the region – even fear of the unknown
- Cost, time and uncertainty of establishment
- Perceived temporary nature leading to uncertainty in staff and partners
- Lack of experience, mature systems, and infrastructure
- Inheritance or imposition of inappropriate rules and regulations

Likewise it may be tempting to form groups, partnerships, or committees implement projects. These can suffer disadvantages too:

- Infighting
- Multiple agendas
- Knowledge fragmented between members of the group
- Bureaucracy, slowness, and cost
- Poor internal and external communication

Government itself is rarely the ideal agent to directly carry out activities that require characteristics such as close contact with industry, building relationships with international partners from different cultures, making judgments about participants, and forcing things to happen in creative ways.

Industry and end-user groups or associations are unlikely to make good Catalysts as they tend to have a very short-term view and fail to bridge the gap between research and industry. Instead they may be valuable in identifying and supporting 'Drivers'.

Driver SMEs

It is notoriously difficult to involve SMEs in research. Research requires investment and contains many risks, such as technical or market failure, or simply being outstripped by others who come along later and stand on your shoulders. To be successful SMEs in general have to be very focused on their day-to-day business, reducing risk and seeking short-term and certain profit. Digital Ecosystems technology is transparent and unintelligible to the end user, a situation that is likely to become a more widespread problem as technology becomes ever more sophisticated. Why should any SME invest time and money in a technology that they can neither understand nor reap profit from in the near future? No amount of 'blue skies' arguments and 'greater good' sentiments make any business sense in terms of the typical SME. Another approach is needed.

Drivers are those few successful and respected SMEs that are already innovative on the basis of personal interest. They have both the mindset and the capability to adopt the technology. They make excellent early adopters, and provide information, case studies, and leadership, in support of more widespread adoption by the mass of 'follower SMEs'. The Drivers in our case were software developers who could develop end-user applications. Often they were already active in Free/Open Source Software, so were receptive to this aspect of Digital Ecosystems and enthusiastic about the possibilities.

Such Drivers can in turn bring their end-user customers into the project. This technique uses the social capital of the supply chain. In some cases, both in our project and in other examples of collaborative R&D involving intermediaries, the SMEs that are the ultimate end-user target are not even aware that they are participating. They trust their suppliers to ensure that they get what they need and don't need to know that they are 'guinea pigs'. It is the Driver who takes on board the risk that failure will damage their social capital and manages that risk.

It was found to be worth supporting such Driver SMEs intensively. We did this in terms of training and practical support, plus financially, with small-scale standardised funding packages delivered via the Regional Catalysts. This meant that our selected Driver SMEs did not have to make a business case to justify their participation in research, which at best will only have long-term gains, against competing business objectives with more certain short-term returns. The participation was cost neutral.

7 How to Prepare a Region as a Knowledge Transfer Agent

We have seen from the West Midlands versus Aragon comparison, that there is no rigid formula for success. Success comes from the interplay of actors and actions within an environment. However, from our formal self-analysis as a project we can identify several factors that will help ensure success:

- Self-analysis to ensure that the initiative is of a type that the region's environment and characteristics can support
- Preparatory education and political consensus-building
- Dedicated people and infrastructure

- Adaptation to local culture and conditions
- A lead organisation (Regional Catalyst) with strong social capital among the target groups

Social Capital Is Crucial

SMEs are best persuaded to participate when their participation is requested by an organisation that they respect and trust, and perhaps know to be a source of funding. It is less a question of what is being asked and more a question of who is asking. It is only human to say 'yes' to a trusted friend asking you to do something you are unsure of, and 'no' to a stranger making the same request. If the Regional Catalyst or a Driver asks their customer to become involved and assures them that it will be of advantage, SMEs are far more likely to agree.

Social Capital can be manifested as network connections, and we found through network analysis that our Regional Catalysts tended to be well connected throughout their regions, both with SMEs and/or with government or other agencies that they could call on for support. An example of this is the Finnish Regional Catalyst for Tampere region, who were already in close contact, via a number of projects, including a national Open Source Centre, with TEKES, the national technology agency.

8 Specific Tools

There are a number of specific tools and techniques that were developed by DBE, OPAALS and PEARDROPⁱⁱⁱ, a project specifically devoted to DBE regional deployment, which can be adapted to assist any region in preparing and managing a knowledge transfer. Examples are:

[1] Social network analysis and visualisation^{iv}

This was extensively used in OPAALS and can provide a way for identifying who are the best-placed organisations to act as Regional Catalysts in terms of their connectivity to other regional actors. It was even produced as a software and used as a demonstrator for part of the research known as the 'EVESim', which can be combined with Google maps^v to produce a geographical visualisation.

Balanced scorecard

A technique for regional self-analysis and inter-regional comparison based on a well-established management tool^{vi} that measures several factors to produce a profile. This was used in DBE to analyse and benchmark regions.

Impact index^{vii}

A definition of a Digital Ecosystem Impact Index (DEII) has been produced by OPAALS but not yet applied.

By researching and selecting appropriate tools, a region can self-analyse, prepare, manage, monitor, and evaluate.

9 Connection to Other Initiatives

A Digital Ecosystem is only a platform: an environment. To achieve something there need to be one or more applications mounted on that platform and used. The dream

scenario is to use a complementary economic development initiative as the application to be mounted. One can then achieve more than the sum of the parts as the application is used to good effect and at the same time the benefits of the platform become better understood. To create a realistic exemplar of a Digital Ecosystem requires a critical mass of infrastructure and of participants. A regional development project can provide both, even if it is unrelated to ICT.

Examples are:

- A regional tourism initiative
- An inter-regional cooperation
- Inner Sourcing and Community Sourcing
- ICT infrastructure improvement or ICT adoption

10 Conclusion

Clearly regions have a very special role in knowledge transfer for economic development, whether in ICT or any other technology. They are able to overcome the significant barriers in very effective ways: ways that are not practical on a national or international scale. They have the social capital that is essential to bring target groups into participation, whether that is SMEs, micro-enterprises, or private individuals. Regions understand the local culture and current climate and can adapt and adopt, acting as technology translators. They are well motivated by the immediate and local economic improvements from their efforts, and may already have infrastructures and complementary projects that can be utilized and multiplied. Given a degree of intelligence in their approach, and a willingness to learn from the experiences of others, regions and their actors are uniquely placed to play a large and important role in harnessing the increasingly rapidly advances in technology for local economic and social benefits.

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