A business view of clustering:
Lessons for cluster development policies

Abstract

How do businesses interact within clusters? What roles do firms play in building up clusters? What are the processes of business clustering? How can clustering activities be supported? These are all questions commonly raised by cluster development practitioners. This paper tackles these complex questions and sets out a framework for understanding the processes of clustering and identifies appropriate opportunities for support.

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SECTION I.
INTRODUCTION

Ask a business what the term cluster means to them, and what response do you get? Some associate no meaning with the word, whereas others view it as academic jargon. There are some businesses, however, who understand the concept of clustering as a strategy for extending the capabilities, resources and responses to levels that would not be achievable as an individual firm. These businesses do not necessarily use the term cluster, but see significant advantage in working with other businesses on joint activities and projects for mutual gain. This 'hands-on' or 'learning-by-doing' approach presents a different and more applied notion of clusters which is grounded in the business development aspiration and goals of groups of businesses.

This paper proposes a framework for understanding the process of clustering from the perspectives of businesses. Our goal in taking a business-led approach to understanding clusters and how they function is to gain better insight into how businesses work together and, as importantly, why they work together. Findings from work in the North East of England indicate that this approach offers tangible opportunities for focused and pragmatic assistance to and stimulation of clusters.

This paper draws on the views of companies in the North East of England and the ways in which they build up clustering links. Over 100 in depth interviews were undertaken in 2 surveys that covered a number of areas of the North East economy and a range of players that include private enterprises, business support organisations and universities. There was particular interest from businesses because of their interest in building relationships and improving their competitive advantage.

The growth of interest in the concepts of clusters and clustering has led to a plethora of policy responses and a wide range of approaches to business development and support. This diversity of approaches is partly due to the wide and differing uses of the term clusters. The rationale for policy maker's interests in clusters is due to the evidence of regional success stories where there is a localisation of production and services combined with the pressures of globalisation[1]. The interest in clusters is fuelled by the potential and perceived benefits, such as rapid innovation and growth, that are envisaged by those embarking on cluster development approaches. These benefits have been shown to have particular impacts on the fortunes of particular regions (Silicon Valley, Italian leather fashion, medical devices in Massachusetts).

Porter describes the following beneficial outcomes[2]:
* Better access to suppliers and flexibility;
* Access to specialised information through personal relationships;
* Joint marketing;
* Local rivalry and peer pressure;
* Innovation through having information on new markets and technological advances;
* Complementary products (e.g. tourist attractions);
* Reputation of an area;
* Pool of experienced labour;
* Access to institutions and public goods;
* Conducive to new businesses.

While there are lessons that policy makers would like to take from regions which have experienced rapid growth, there is debate and uncertainty as to what lessons can be transferred. One way forward is to identify the 'ingredients' and critical success criteria for a specific case and then extract those principles that may be transferable. What is required in this scenario is the ability to take the lessons of specific cases such as Danish insulin production or Italian tile making, and learn how and why they occurred. These lessons can then be identified and applied in other contexts that turn them into appropriate locally adapted policies for another region and another industry. Successful policies have to be tailored to the specific conditions of an economic area or space, but built on principles from successful cases. Such a tailored approach starts by building on what businesses are doing already, rather than trying to bring in models from very different contexts.

Much of the existing work on cluster development concentrates its efforts on describing the potential benefits and drivers for forming groupings, but does not explain *how* clustering takes place on a day-to-day basis. Many commentators stress the importance of building close relations and trust, but they do not explain how this occurs and how cluster development policies can support and stimulate the development of trust and intimacy.

Understanding the processes of clustering raises particular difficulties as they may be unobservable or hidden within day-to-day practice. For example, linkages between clusters are often based on relationships of trust and reciprocity that are built up over past experience. Indeed, within the cases of clusters studied, businesses spent resources building up close relationships with others in the group. Attempts to examine the process of clustering have concentrated on those aspects that can be observed and measured easily such as formalised links and associations. The study on which this paper is based found that informal ties are often drawn on and businesses value these links highly.

This paper is divided into four sections. Following this introduction, we present a working definition of clusters and clustering based on the experiences of businesses we interviewed. A number of definitions are examined and common themes are summarised. The importance of looking at different scales of clustering is demonstrated and a framework for categorising clusters is set out. We look at the process of clustering and the importance of understanding how clusters can develop. This entails a focus on cluster*ing*, rather than attempts to conceptualise a static cluster with defined boundaries. The third section explores this process of clustering, drawing on the analysis of clustering activities of 100 firms in different industries in the North East of England. A number of anticipated outcomes from clustering are demonstrated and the types of linkages used to reach those ends are identified. The fourth section shows which types of linkages are used by businesses for different anticipated outcomes and how the framework can be put into practice by business support organisations, policy makers and businesses themselves.

SECTION II
THE PROCESS DRIVEN APPROACH TO UNDERSTANDING CLUSTER*ING*

2.1 The three Cs of clustering

The term 'cluster' has been interpreted in many different ways and there are many different definitions used. Broad definitions have been taken from the publications of DTI, Scottish Enterprise and the work of Michael Porter. These are:

➢ "A group of organisations in related industries that have economic links" (Scottish Enterprise, 1999).

➢ "Geographic concentrations of interconnected companies and institutions in a particular field" (Porter, 1990; 1998).

➢ "Concentrations of competing, collaborating and interdependent companies and institutions which are connected by a system of market and non-market links" (DTI, 1999).

By extracting common themes, three underpinning principles of clustering can be identified. These are present in different degrees regardless of structure, size and sector.

1. **Commonality**; i.e. the businesses are operating in common fields or related industries with a shared market focus or sphere of activity.

2. **Concentration**; i.e. there is a grouping of businesses that can and do interact.

3. **Connectivity**; i.e. interconnected/linked/interdependent organisations, with a range of different types of relationships.

All scales of clusters share the three common elements that describe the process of clustering, as described above, with linkages of different kinds. There are a wide range of *scales* of clusters from a small number of companies up to whole sectors and combinations of sectors. For example in the offshore industries cluster on Tyneside in the North East of England, there is a commonality with the shared market focus on the provision of products and services to the offshore oil and gas industry; there are concentrations of firms in the Tyneside area, especially along the River Tyne; and there is connectivity with firms having multiple relationships for innovation, delivering products, marketing and training. These relationships range in scale from inter-firm linkages and alliances to an industry wide trade association, the Northern Offshore Federation. Within clusters are a range of types of relationships, both vertical and horizontal, formal and informal. These types of linkages and relationships are discussed further in section 3.

2.2 Why a process model of clustering?

The results of two studies in the North East of England demonstrate that businesses develop multiple interactions with other organisations and institutions that they may use for many business goals This allows them to build up cooperation and relationships that can result in extended reach and economic advantage. These activities of formation and reformation of ties, can be considered clustering, i.e. the process or means of cluster development. By understanding the processes of *clustering*, support can be targeted at the activities and actions that companies and other relevant institutions need to undertake to develop clusters.

There are three reasons why cluster development policies can benefit from understanding the process of clustering:

1. Clusters are not static and do not have fixed boundaries.
Different organisations within the cluster area may have links outside the cluster which get drawn on at different times. The nature of relationships are highly dynamic and are constantly evolving because businesses change and develop new opportunities. So attempts to understand clusters through a snapshot and to fix boundaries are not realistic. An examination of the activities and processes of businesses and supporting institutions in particular areas allows cluster development approaches to follow these linkages and relationships as they evolve and develop.

2. Clusters have different stages of development.
An understanding of the processes of clustering not only allows cluster development to work with existing or 'working' clusters[3], it also allows for a consideration and segmentation of clusters that includes those that are potential and emerging. Emerging clusters are not just based on concentrations and commonalities, there are also some forms of connectivity stating to form. With potential clusters there may be concentration and commonality but without connectivity or linkages.

3. Cluster development approaches should be based on what businesses do at present, using the language they use and their 'styles' of doing business.
An understanding of the processes of clustering allows cluster development support to build on what is already growing and existing rather than bringing in models from other industries, other locations and drawn from the enticing case studies that are often interpreted as transferable models. Frameworks of how clustering can take place allow us to take ideas of how business can learn and harmonise them to a locality. Support approaches that are grounded on the existing processes of clustering are more likely to be appropriate to and supported by businesses in a locality.

SECTION III
THE ANTICIPATED OUTCOMES AND ACTIVITIES OF CLUSTERING.

3.1 Clustering activities

Much has been written about the potential benefits of clustering, drawing on case study material from around the world and from different industries[4]. The list of potential outcomes from clustering, given on page 1, is part of the attraction of the cluster approach as the case studies imply that these are the factors that result in dramatic economic growth in those locations. However, these are a mixture of the outcomes that tend to fall into two categories: firstly benefits that might accrue to a group of businesses (information from relationships, joint marketing etc) and secondly policy perceptions (rivalry, complementary products, reputation, pool of skilled labour, conducive to new business)

The research on carried out with 100 businesses in the NE of England identified a set of business activities or processes that are the outcome of clustering. The clustering activities in most businesses fall into one of the 7 categories shown in table 2. These activities can be carried out by businesses alone or by drawing on linkages with other companies. They may also be undertaken in different ways when in a group compared to when they are carried out by individual companies:

Table 1. Clustering activities

Activity/outcome	How undertaken in a group
New product development	Joint R and D, sharing information and ideas, peer review of R and D, influencing the research agenda of universities
Getting Finance	Closer access to finance bodies (especially venture capital), supplier credit
Getting and keeping business	Referrals, joint marketing, gathering market information, improving the image of an area
Providing products and services	'Just in time' delivery, help supplier improve quality and reduce costs, joint purchasing and transport, share equipment, technical assistance, bench marking
Training	Joint courses, setting curriculum with training providers
Lobbying	To influence the business and regulatory environment
General networking	Get contacts to help with other activities, put something back into the community

3.2 The nature of linkages and structures of cooperation

Analysis of the clustering processes in 100 businesses demonstrates that different types of linkages are used to reach the outcomes identified above. These links are constantly evolving and can also be drawn on for reaching other outcomes. Businesses may use a number of different types of linkages with a number of different businesses or groupings of businesses in order to meet their goals. The research showed that clustering involves multiple linkages which are horizontal and vertical, as well as informal and formal. The following kinds of links for collective action were reported by the businesses in the survey.

Table 2. Types of linkages

Linkage for collective action	Definition and description
Vertical supplier links	Relationships with individual customers or suppliers used to provide a better service. These are usually based on interpersonal relationships although they can be supported with contracts
Horizontal informal links	The ability to contact other firms for information, assistance, referrals and learning. Built up through reciprocity over time and previous knowledge of each other. They are seen by businesses as a safety net and a "bank of goodwill"
Horizontal formal collaboration	Collaboration between a small number of companies (less than ten) for joint activity. Relationship supported by formal agreement or contracts
Formal associations	Membership clubs, trade associations and networking groups that are set up by service providers.
Gaining access to common assets and resources	Government bodies (local, regional, national and international) that provide services, education and infrastructure which individual companies could not provide themselves. Some private sector organisations can provide these goods if there is demand from companies e.g. training colleges.

1. Vertical supplier links

The linkages between suppliers and customers is an area that is well documented and there has been considerable attention given to 'supply chain development' by companies themselves and those supporting them. These are used to develop better services for the customer in terms of timeliness and quality of service. The vertical supply chain links are found to varying degrees in all types of firms. Examples of these types of links include advertising and PR companies' links to designers (web and paper based) and printers, or 'just in time' systems for high volume manufacturing. These links are particularly well developed in the automotive sector. Firms supplying manufacturers and engineering firms can decide to locate staff on their customers' site to ensure the service is improved and problems solved rapidly. Examples found in the North East of England automotive cluster include paint suppliers for car part manufacturers and chassis makers co-locating with assembly plants.

Vertical supplier links are often centred around individuals within the companies although many companies try to develop links between staff at different levels and the corresponding number with the supplier/customer. These links can build up over long periods of time and involve the development of relationships based on strong bonds of trust. In many cases the use and nature of the links are underpinned by the power of dominant customers. This is illustrated by car manufacturers working closely with suppliers to ensure costs are reduced. In such cases the co-operation is based on the power exerted by the customer rather than the trust that has been built up.

2. Horizontal informal links

All businesses were found to have a large number of linkages with other firms in related fields who were not suppliers or customers. They may remain dormant or hidden until they need to be called upon for a certain activity. In this regard they can be seen as a safety net and a bank of goodwill and favours that are built up through the exchange of referrals, information equipment or other support. These kinds of links allow individuals within firms to contact other firms and individuals as and when needed. These links may also come in the form of visiting each others companies and support bench marking. The links are developed through reciprocity such as helping out when in trouble and referrals to each other.

These forms of links are dependent on personal trust, confidence and respect being built. This occurs through experience of working together, following 'unwritten rules'. The way companies may build up trust is not always apparent to the companies themselves. When many of the companies were asked how they knew they could trust the others, they said they did not know as they had not thought about it or made a calculation. This is seen as a gut feeling, 'you get a sense of who you can trust', or 'it is an instant thing'.

Trust can be built on existing links and ties. These may be through friends and family or from previous work. One of the most important mechanisms by which ties and information on reputations is spread around a cluster is through the movement of staff. Businesses will often place a high value on recruiting people with existing networks. All of these aspects tend to grow with use and are reinforced through using the linkages built on trust.

3. Horizontal formal collaboration
Some forms of horizontal links are formalised through having a contract or written agreement. This may be a partnership in product development or collaborative research projects with technical agreements and confidentiality contracts. Some groups of companies form a separate umbrella company and present themselves as a joint venture. The wording used in each case will differ according the industry as the terms used have to be understandable to clients.

The type of formal link used depends on the expected outcome of collective activity. For new product development, formal links are usually in the form of a number of bi-lateral joint ventures, as larger groups result in greater difficulties in managing intellectual property. For other activities such as joint marketing, larger groups are more appropriate.

Some forms of formal collaboration can also be initiated because the companies involved are part of a group of firms that have a common owner or shareholder. In such cases, the co-operation is more of a 'top down' process, dictated by the owner of the businesses rather than through the development of a working relationship over time.

4. Formal associations and networking fora
Formal associations include membership clubs, trade association, and events hosted by service providers, such as solicitors or accountants. Groups can also come out of publicly funded business support organisation activities that have networking activities. Two of the most important roles of formal associations are acting as a means for micro scale linkages to develop and lobbying national bodies and regional/national government.

There are a number of ways these are built up and established. For many businesses, their participation in the functioning of associations is through paying membership fees and attending meetings. There are many associations which are not sustained, as the members may not feel they are getting results and the cost of participation in terms of time and resources is too high. Factors that are seen to attributing to successful associations include:

- Set up by a respected institution or individual.

- Leadership qualities, enthusiasm and self sacrifice by the initiators.

- Climate of trust and affinity amongst members.

- Organisation is responsive to members and there is a critical mass to ensure members get benefits. Funding of some activities from external sources can support this although this can lead to the association becoming dependent and therefore unsustainable.

- The need to compete against competition or dominant firms. In these cases, businesses stated that there is an element of pressure to co-operate due to their inability to get certain services and benefits on their own.

5. Gaining access to common assets and resources

A final clustering process involves decisions to locate or remain in a particular location because the relative proximity allows the business to use common assets and resources. These assets may be tangible infrastructure and facilities such as university equipment and libraries, transport networks or training facilities. They may also be intangible assets such as a pool of skilled labour, the reputation and image of the area, and the general regulatory environment. These assets are 'public goods' that are available to all or most businesses within an area.

When individual companies cannot provide these services, education and infrastructure themselves, provision can be undertaken by the public sector. The most common structure or linkage is through government bodies (local, regional, national and international) and increasingly through public/private partnerships.

Businesses themselves do not play a direct role in building collective action within the enabling policy environment, apart from lobbying and agreeing to follow laws and regulations. The ways that public sector bodies can support clustering linkages is categorised by Enright (2000) into those policies that are catalytic and those that are more interventionist. The ways in which public bodies will operate depends on the political persuasion of the government, the form of local, regional and national governance. These issues are discussed in detail elsewhere, and are not part of the remit of this paper.

SECTION IV.
A FRAMEWORK FOR SUPPORTING THE PROCESS OF BUSINESS CLUSTERING

The previous section has set out the role of the private sector in clusters by looking at the potential outcomes and nature of the linkages. This section presents a framework for understanding the process of clustering and may be used by cluster development practitioners to identify opportunities for support.

4.1 A framework

Building on the research carried out with 100 companies in the North East of England, this section proposes a framework that can be used as a tool for identifying appropriate cluster development activities and support. It is a three step process:

1. Identifying the anticipated outcomes of clustering, the reasons why businesses may want to cluster (Table 1)
2. Documenting the existing types of linkages, structures and forms of organisation that can be used in clustering (Table 2)
3. Mapping the expected outcome to the most appropriate type of linkage and then identifying were linkages can be strengthening.

Table 3 demonstrates the relationships between the first and second dimension, although it must be noted that it is an overview and hence a simplification of a complex set of interactions. This table shows that for each type of linkage there are many different activities. The table below is based on clustering in the North East of England and can be seen as a menu of potential opportunities arising from a particular set of studies.

The table can also be used in its 'empty' form as a framework for building a bottom-up approach to cluster development in a particular region. In such cases, cluster development practitioners can document the clustering activities currently taking place. Therefore it can be used to pin point what are the reasons why businesses want to cluster, what are the activities that they do together and the nature of the linkages that they use to get there.

4.2 Forms of Support

Three forms of external support can be considered:
- Facilitating the development of clustering linkages of different kinds
- Providing funding for groups of businesses to carry out activities
- Provision of common assets such as education, services and infrastructure and a regulatory environment that supports the process of building the different types of linkages.

Table 3 Relationship of the type of linkages to the outcomes of clustering

	Vertical supplier links	Horizontal formal collaboration	Horizontal informal links	Formal associations	Gaining access to common assets
New product development		Carry out R and D Peer review	Get and share ideas	Exchange ideas	Influence research agenda Information on technological trends
Getting Finance	Supplier credit		Access to finance bodies		Improve area's reputation with financiers
Getting and keeping business	Referrals	Referrals Joint marketing	Referrals	Improve the image of an area Provide market information Organising trade fairs and delegations	Improve the image of an area Market information Information on customers and competitors
Providing products and services	Guarantee quality and timeliness Reduce costs of suppliers Get technical help Go the extra mile Joint purchasing and transport	Economies of scale Get technical help Share equipment Joint purchasing	Share equipment Get technical help	Bench marking General information on technology, exporting etc	Improving the regulatory environment Business' access to skilled labour
Training		Joint courses			Set training agenda and curriculum
Lobbying				To influence the business environment	To influence the business environment
General networking	Get contacts	Get contacts	Get contacts	Get contacts	

The first element can play a vital role in building up the links of different kinds between companies. There are two ways to support businesses in this way. Firstly firms can be supported and made aware for the benefits and means of clustering by specialised network brokers. Secondly, support and training can be provided to individuals and firms who can or are already playing facilitatory roles. There are a wide range of people and firms that are business support providers from the public and private sector and include business service providers such as accountants, solicitors, management consultants and other advisors as well as individuals in business support organisations funded by the public sector. Their abilities can be improved though training in the processes of clustering and details of the particular industries in the cluster.

There is a danger of concentrating only on formalised groups as these are easily measurable and satisfy the needs of public sector funding body evaluations. However, informal linkages are also important, although measuring them presents particular challenges because they may remain hidden until a critical moment and they are not easily observable.

Support can be provided to formal association and potential and emerging associations. The type of support should build on lessons from existing formal associations as described in section III. It should be noted that there are already a large number of public sector promoted networking associations which are competing for the time and interest of businesses. The issue of funding groups of businesses to carry out activities needs to be treated with sensitivity. This may be needed if the companies would not be able to carry out the activity, are not aware of the benefit or feel it is a public good which would not be cost effective for them to provide.

Finally, clustering can be supported by the provision of common assets or public goods such as education and training, physical infrastructure and other services that support innovation. In the North East of England, as in many other areas of the UK, there are many initiatives and programmes in these areas. The challenge for cluster development approaches is to engage businesses and their representative associations in the decision making process so that resources are invested in those areas that meet the needs of the clustering firms. Deciding which clustering areas to support and which to ignore becomes a political decision. Policy makers can be supported in this decision if there is information on three key factors of a national or regional economy:
- the growth potential of a clustering area
- the evidence of existing linkages
- the extent of concentration in the region.
These factors and ways of measuring them are addressed elsewhere.

4.3 A methodology for supporting cluster development

The objective of this paper is to identify how cluster development policies can engage with the clustering processes of businesses. Drawing on research carried out in the North East of England and comparing it to other studies, a four step process for cluster development can be identified. Of particular importance is the recognition of entry points for cluster development that are based on how businesses engage with each other and act collectively. The research has shown that there are a number of different reasons why firms work together and cluster, and there are a number of different types of linkages that each company may develop. These may be vertical or horizontal, formal or informal.

The framework presented here allows for policies to be developed that respond to the uniqueness of each locality or context. Rather than replicate a model from else where, cluster development requires policy makers to look at the resources, institutions and current approaches to business in the area and build on them. The process given below outlines the steps that can lead to cluster development policy that is based on what businesses are doing and so embedded in a particular locality.

A four step process for tackling cluster development is given below.

1. Identify and clarify the expected outcomes
There area number of benefits from clustering and these may cover several business processes: new product development, getting finance, getting and keeping business, providing products and services, training, lobbying, general networking. Firms need to identify the potential of these activities and clarify what they want from the collective action.

2. **Map out different types of linkages appropriate for each expected outcome**

There are a number of types of business linkages that firms can use, including: vertical supplier links, horizontal formal collaboration, horizontal informal links, formal associations, gaining access to common assets. Each of the activities listed in step one can be achieved through one or more of these types of linkages. Therefore detailed clustering action plans can be identified for each clustering activity based on building up different types of links. The process of building up links requires an understanding of how trust and relationships are strengthened.

3. **Supporting the process of strengthening linkages**

Once businesses have identified why and how they want to cluster, cluster development support organisations can identify where they have a role to play, and more importantly, where they do not. Support can come in the form of identifying best practice from the locality and elsewhere, facilitating the process of building relationships and finally provision of common assets such as infrastructure, skills and reputation of a locality.

4. **Learning by doing**

This step model is an iterative process that requires those supporting it to be continually innovating their support as the firms they are working with may be innovative in terms of product development and organisational structures. In each case the history and context of the cluster will mean that different strategies will need to be taken.

Figure 1. Four step process for cluster support

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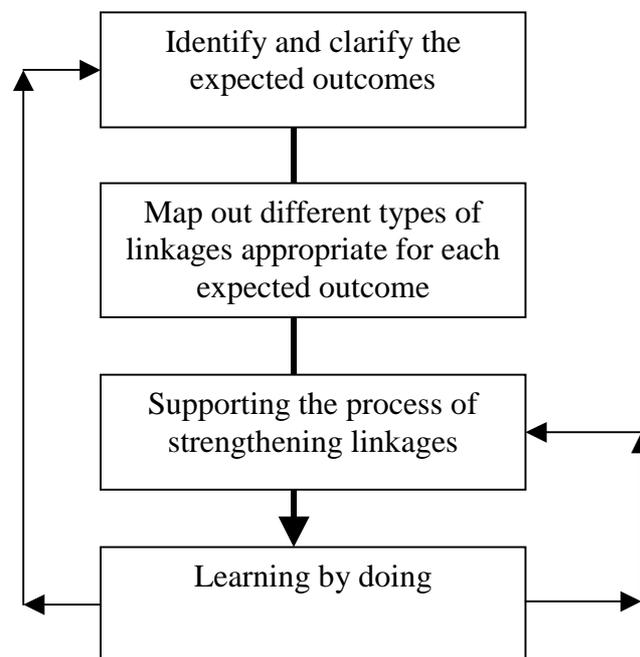
[1] See M. Enright (2000) The globalization of competition and the localization of competitive advantage: Policies towards regional clustering, in N. Hood and S Young, The globalization of multinational enterprise activity and economic development

[2] M Porter (1998) Clusters and the new economics of competition, in Harvard Business Review Nov-Dec

[3] M. Enright, (2000)

[4] M. Porter (1990) The Competitive Advantage of Nations, and Porter (1998).